WESTERN EDITION
MARCH • 1957

American Fruit Grower

Ten Questions and Answers on Leaf Analysis

How to Correct Nutrient Deficiencies

Fruit Areas of America—Idaho

Make Profits with Sweet Cherries

• FERTILIZERS—When and How to Apply Them •

SPRAYING'S DONE

...and in the nick o' time

Wendell Brough's D2 pulling 400 gal. sprayer. Pulls at a constant speed uphill or down.

When Wendell Brough, Aspers, Pa., and his CAT* D2 Tractor head for the orchard on those wet April mornings, there's never a doubt in his mind but that come nightfall he can look back with a satisfied feeling of accomplishment. He knows that regardless of slick and muddy spots, his spraying has gone on schedule. He feels safe and comfortable, knowing that his sprayer can't boss his D2 around – can't shove him and jackknife him downhill, nor rear back and make his tractor slip going uphill. And every day he runs his Diesel D2, he's putting extra dollars into his pocket – money he *won't* have to spend on gasoline – that he *won't* have to spend for extra help.

He knows that tomorrow when spraying's over, he can quickly switch to those 101 other jobs around the orchard. In *minutes* he can mount his Cat Tool Bar equipment to clear out trees that winter killed, bulldoze drainage ditches, build ponds or subsoil his orchard. He handles a big disk and harrow with ease – making fewer passes, saving time and money.

It's labor and money saving performance like this that prompts Wendell Brough to say, "My D2 is doing a fine job. If it performs as well as my former Cat track-type Tractor, I'll never have any complaints. Even in these cold Pennsylvania winters I never have any trouble starting."

Can you say as much for your present tractor? Think it over. Check with other successful orchardists – then see your Caterpillar Dealer. Name the date – and he'll demonstrate!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

WRITE FOR FREE BOOKLET "Tires or Tracks"

Caterpillar Tractor Co., Peoria, Ill., Dept. AMF37

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I have_____acres in my orchard.

Name_____

Address_____Telephone_____

City_____State_____

CATERPILLAR*

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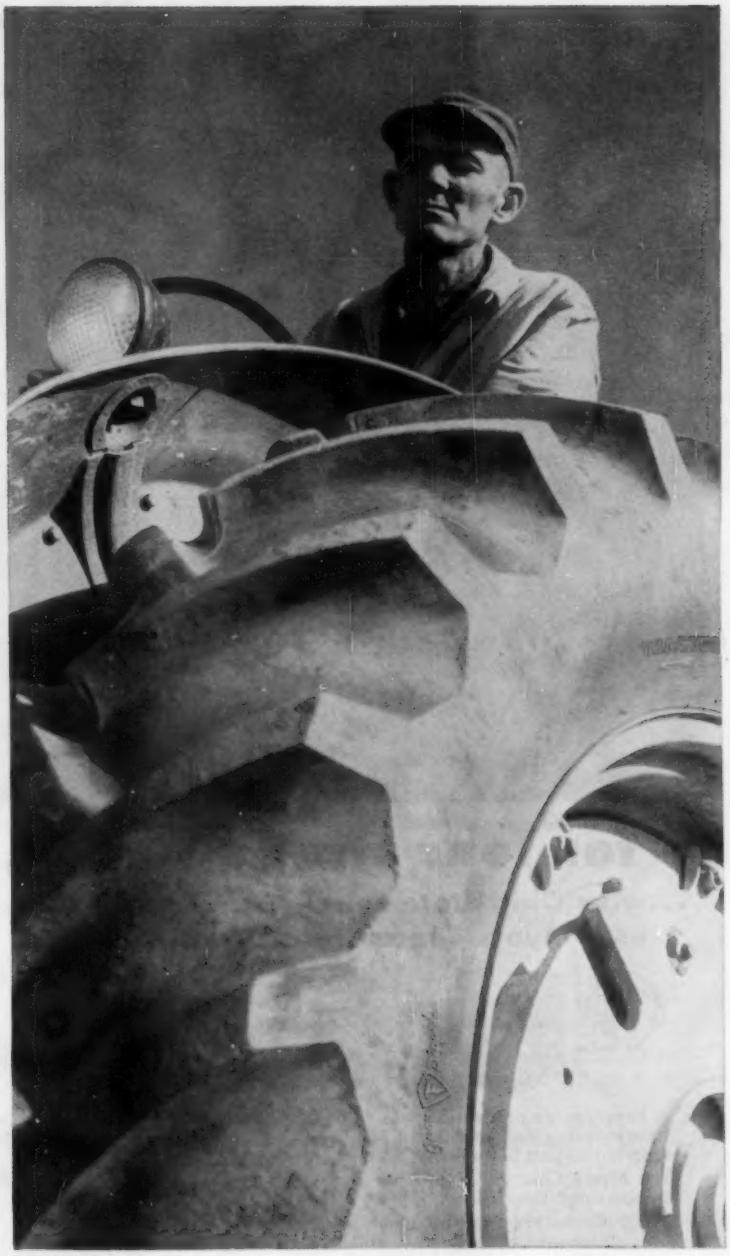
DESIGNED FOR THE ORCHARD

"They clean out better and they last longer"

—Gus Pappas, Rosebush, Michigan, says that's why he prefers

FIRESTONE CHAMPION GROUND GRIP

Gus Pappas depends on Jasper Rhynard, Firestone Dealer in Ithaca, Michigan, to supply all his farm tires. Your Firestone Dealer or Store can supply your tire needs, and Firestone Hydro-Flation service, too.



For every tractor he's owned—and he's owned 16—Gus Pappas has chosen Firestone Tires. Today Gus is farming 200 acres of his own and he also does custom work on an additional 320 acres . . . thinks the Firestones on his big diesel are better than ever.

Gus joins a majority of farmers who have shown an overwhelming preference for Firestone Champion Ground Grip® Tires—based on performance and on economy. The stronger cord body of this tire has been made under strict nuclear control to insure uniform cords and rubber construction that will withstand impact without damage. Extra tread plies minimize or even neutralize sharp impact by absorbing the shock.

The working tread was designed and proved on farms by Firestone for quick, positive cleaning in the toughest soil conditions—to make *all* the tread available *all* the time. Scientifically flared tread openings take full advantage of rotating force and flexing action to toss out mud and keep you working where no other tire could.

See the Firestone Champion® Ground Grip at your Firestone Dealer or Store, a good place to go for all your tire, battery and service needs.

Firestone

BETTER RUBBER FROM START TO FINISH

Enjoy the Voice of Firestone on radio and television every Monday evening over ABC

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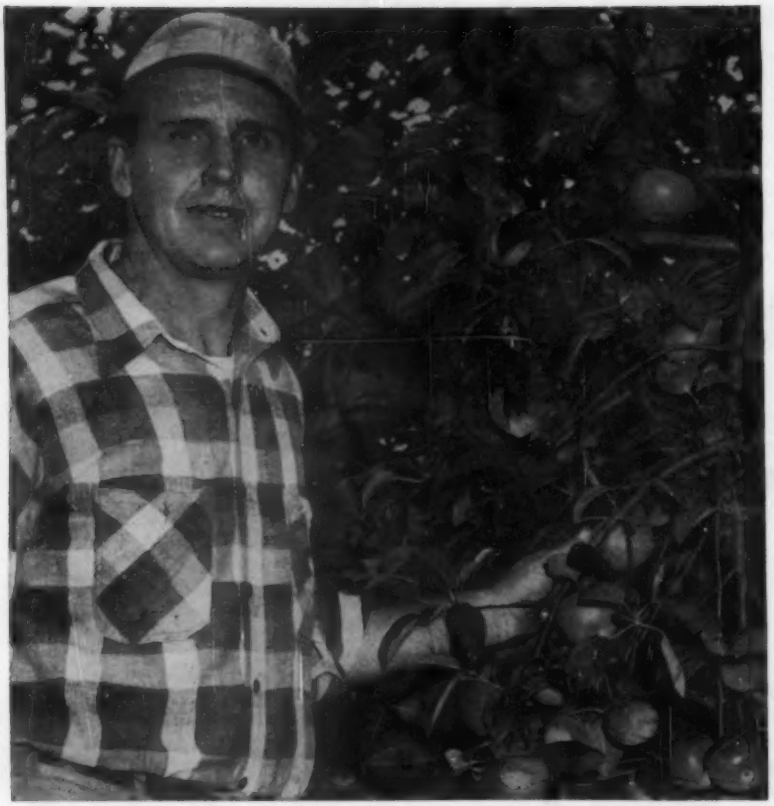

for four straight years

...wins Ohio State Fair Apple Sweepstakes...
uses Myers Concentrate Orchard Sprayer

RAY CHAMBERLAIN
Oberlin, Ohio
Winner, Best 40-Tray Apple Display
Ohio State Fair, 1953, 1954, 1955, 1956

A better, more profitable apple crop year after year is proof that concentrate spraying pays off for this leading Ohio grower. But, a more saleable crop is just part of the story.

His Myers Concentrate Sprayer also saves time, materials and labor all season long. Here's how!

Conserves water . . . needs fewer stops for refilling.
One-man operation . . . no hired spraying help.
Effective penetration of heavy foliage.
Better over-all, even coverage.
Faster operation . . . cuts spraying time two-thirds.
Better fruit finish . . . more fancy fruit.
Simple operation . . . easy control from the tractor seat.

To find out how the Myers Concentrate Sprayer can put more profit in fruit growing for you, call your nearby Myers sprayer dealer.

Myers

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POWER SPRAYERS
WATER SYSTEMS
AND WATER SOFTENERS

LETTERS
TO THE EDITOR

Spray Safety Chart

AMERICAN FRUIT GROWER
SPRAY SAFETY CHART EXCELLENT INDUSTRY SERVICE. CONGRATULATIONS ON FINE JOB.
RICHMOND, CALIF. F. CZUFIN
CALIFORNIA SPRAY-CHEMICAL CORP.

Dear Editor:

. . . This is a worthwhile project and one which will do your readers an excellent service.

New York City Frank H. Cappy
American Cyanamid Company

Dear Editor:

. . . Your chart is very well done. It is about the most comprehensive item of this kind that we have seen.

One of the primary causes of accidents results from the careless handling and storage of pesticide chemicals where small children can get to them. It is gratifying to see that you have emphasized proper storage and destruction of empty containers. Accidents involving small children are particularly distressing, and so needless. For that matter, practically all accidents involving pesticide chemicals are needless, if suitable precautions are taken.

It is also gratifying to note that you have emphasized the necessity of reading the label. Too many growers ignore this step.

Middleport, N.Y. R. M. Wilhelm, Jr.
Niagara Chemical Division,
Food Machinery & Chemical Corporation

Dear Editor:

. . . You are to be complimented on the chart. Making it available to your readers should provide a sound basis for continuing to alert growers to the proper methods of safe handling of pesticides.

Wilmington, Del. C. J. Krister
E. I. du Pont de Nemours & Company

Dear Editor:

. . . Let me congratulate you for doing a job that has been long overdue in the field of agricultural chemicals. Your unselfish and comprehensive approach to the problem is both gratifying and commendable.

Reading, Pa. Robert P. Henry
Willson Products Division, Ray-O-Vac Co.

The Secret of Good Fruit

Dear Editor:

L. E. McWilliams of Mexico, N. Y., who, with his son, Francis, conducts a very successful fruit farm on Scenic Highway No. 3, confessed his major secret in fruit farming to me a few months ago. He has been so successful in raising a variety of fruits (apples, cherries, and pears as well as some plums and peaches) that I remarked about his versatile ability to make trees grow and asked him if he would expain the reason.

"Yes," he said, "I will—I baby them along a little."

Among fruit growers that needs no comment, although one might add here what Confucius said about the best fertilizer on the farm being the footsteps of the owner.

Pierrespont Manor, N. Y. Lee Wasmuth

Phix* THE ANSWER TO YOUR SCAB PROBLEM

HOW MUCH of your profit will you let apple scab take? It can take it all, if you let it.

That's why this year again, thousands of apple growers all over the country are choosing PHIX—the effective and mild organic mercury fungicide which kills scab spores quickly and thoroughly.

GROWERS LIKE PHIX because it is a dry material which is easier and more convenient to use, to store, and to handle; because PHIX has indefinite shelf life; because PHIX is the most economical eradicant fungicide you can get—whether you use mercury in an eradicant or in a protective schedule; because PHIX has been shown to have these advantages in practical use by leading and successful commercial orchardists as well as by leading agricultural experiment stations.

GET Phix for the BEST in
EFFECTIVENESS
EASE
EFFICIENCY
ECONOMY
CONVENIENCE

Phix is available from most leading spray chemical suppliers. Insist on Phix!

ORDER Phix from your dealer early. If he does not yet have Phix write, wire, or phone your order to us with your supplier's name.

Write for descriptive folder.

CHEMLEY PRODUCTS COMPANY
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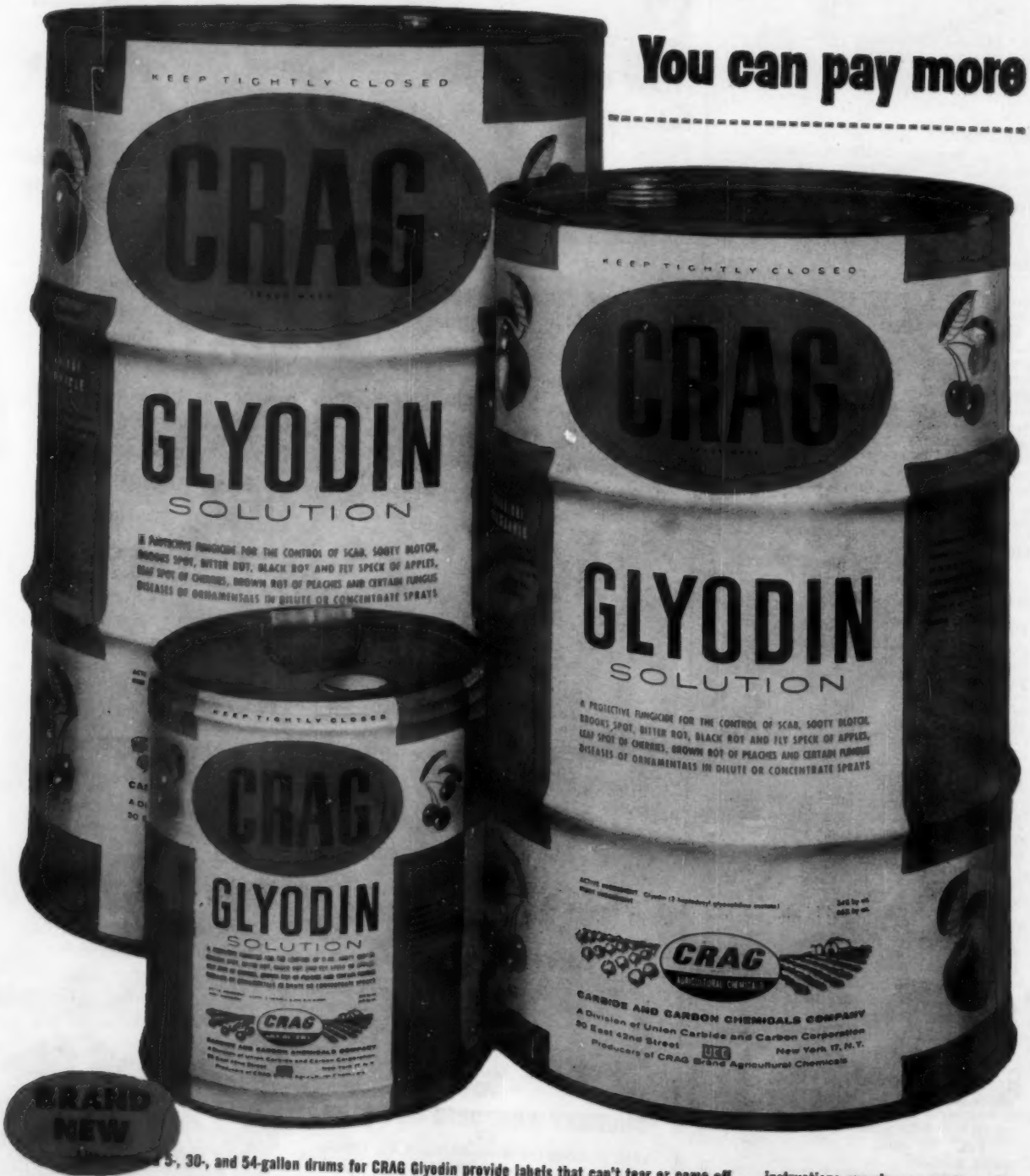
TOP QUALITY

You can pay more


KEEP TIGHTLY CLOSED
CRAG
GLYODIN
SOLUTION
A PROTECTIVE FUNGICIDE FOR THE CONTROL OF SCAB, SOOTY BLOTCH, BROOKS SPOT, BITTER ROT, BLACK ROT AND FLY SPECK OF APPLES, LEAF SPOT OF CHERRIES, BROWN ROT OF PEACHES AND CERTAIN FUNGUS DISEASES OF ORNAMENTALS IN DILUTE OR CONCENTRATE SPRAYS
CARBIDE AND CARBON CHEMICALS COMPANY
A Division of Union Carbide and Carbon Corporation
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New York 17, N. Y.
Producers of CRAG Brand Agricultural Chemicals
BRAND NEW

5-, 30-, and 54-gallon drums for CRAG Glyodin provide labels that can't tear or come off . . . instructions are always easy to read.

at LOW COST

but you can't buy better control of apple scab!

ALL SEASON PROTECTION

CRAG Glyodin fungicide provides powerful *all season* protection against apple scab when used in early sprays and cover sprays. It also controls summer diseases such as sooty blotch, bitter rot, Brooks spot, fly speck, and black rot. Glyodin is effective against brown rot of peaches interplanted with apples, and cherry leaf spot. For only 75¢ per 100 gallons of early spray and 54¢ per 100 gallons of cover spray, CRAG Glyodin offers unmatched advantages that mean better fruit at lower cost.

HELPS INSECT CONTROL

CRAG Glyodin teams up with insecticides . . . some insecticides tend to be more effective with Glyodin than with other fungicides. This extra Glyodin advantage has been proved in 13 tests in which 21 different insecticides, miticides, or combinations of the two were used with several fungicides. Comparative results were obtained from tests on codling moth, curculio, green apple aphis, mites (European red, two-spotted, and Schoene), red-banded leaf roller, and rosy apple aphis.

CUTS MITE SPRAY COSTS

CRAG Glyodin saves as much as three miticide sprays a year when used in full-season schedules of early sprays and cover sprays. In one season, a grower saved $1,166 in special mite sprays because Glyodin kept mites from building up in his orchard. CRAG Glyodin kills both adult mites and nymphs on contact. And, unlike some apple fungicides, it does not harm beneficial insects that feed on mites. CRAG Glyodin cuts mite spray costs!

THE SCAB SPRAY THAT PAYS MORE WAYS

CRAG Glyodin works equally well in dilute or concentrate sprays to provide outstanding protection that helps assure maximum yields of clean fruit with the color and finish the market prefers.

For efficiency and economy, CRAG Glyodin is your best fungicide buy! Plan now to use it all season long. See your supplier . . . or write for full information.

CARBIDE and CARBON CHEMICALS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

"CRAG" IS A REGISTERED TRADE-MARK OF UNION CARBIDE AND CARBON CORPORATION

CRAG BRAND AGRICULTURAL CHEMICALS

The ground-hugging, 2-3 plow "420" Utility Tractor is compact, stable, easy to handle, ideal for work in groves, orchards, berries, and vineyards.

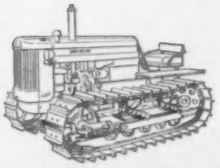
BOOST YOUR Earning Power

with a *New* JOHN DEERE *420*

You'll like the modern looks of a new John Deere "420" Utility—and you'll profit by its stepped-up Earning Power. Here's traditional John Deere simplicity in a modern, versatile, sure-footed tractor for your special needs. It handles 3-bottom plows, 6- or 8-foot disk harrows under most conditions. Matches the work output of much larger tractors on jobs such as mowing, spraying, etc. Best of all, it saves you money. The first cost is low. Fuel and maintenance economy is exceptional. There's a full line of low-cost, time- and labor-saving tools.

Only 50 inches high, the "420" Utility snugs up to trees. Has "live" Touch-o-matic hydraulic system for precision control of working tools, with 3-point hitch for rapid, easy change . . . Load-and-Depth Control for uniform work in changing ground conditions . . . deep-cushion adjustable seat . . . smooth clutching . . . standard speed PTO; also, high-speed drive. Power-adjusted rear wheels are available as optional equipment.

See your John Deere dealer soon, and ask him for a free demonstration.



THE "420" CRAWLER

Now available with heavy-duty *3-point hitch*, direction reverser, auxiliary foot throttle—and many other modern features for peak earning power. Dependable, sure-footed, low-cost, all-weather worker with 3-4 plow power for field, orchard, grove, and vineyard.

ASK ABOUT THE JOHN DEERE CREDIT PLAN

New Optional Features of "420" Tractors

- New 5-Speed Transmission—Provides an extra speed of 6-1/4 mph on wheel tractors; ideal for mowing, rotary hoeing, etc. On Crawlers, provides a new speed of 3-7/8 mph in fourth gear, and 5-3/4 mph in fifth.
- New Direction Reverser—Provides complete range of forward and reverse speeds without shifting gears. Speeds up such jobs as loading or dozing.
- New Continuous-Running PTO—Available with 5-speed transmission on wheel tractors (regular on crawler). Controlled by tractor clutch pedal. PTO continues to operate when tractor motion stops.
- New Auxiliary Foot Throttle—Provides up to 25 per cent higher transport speed, and increases speed, when needed, at any setting of the throttle.

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Name _____ ☐ *Student*

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Town _____

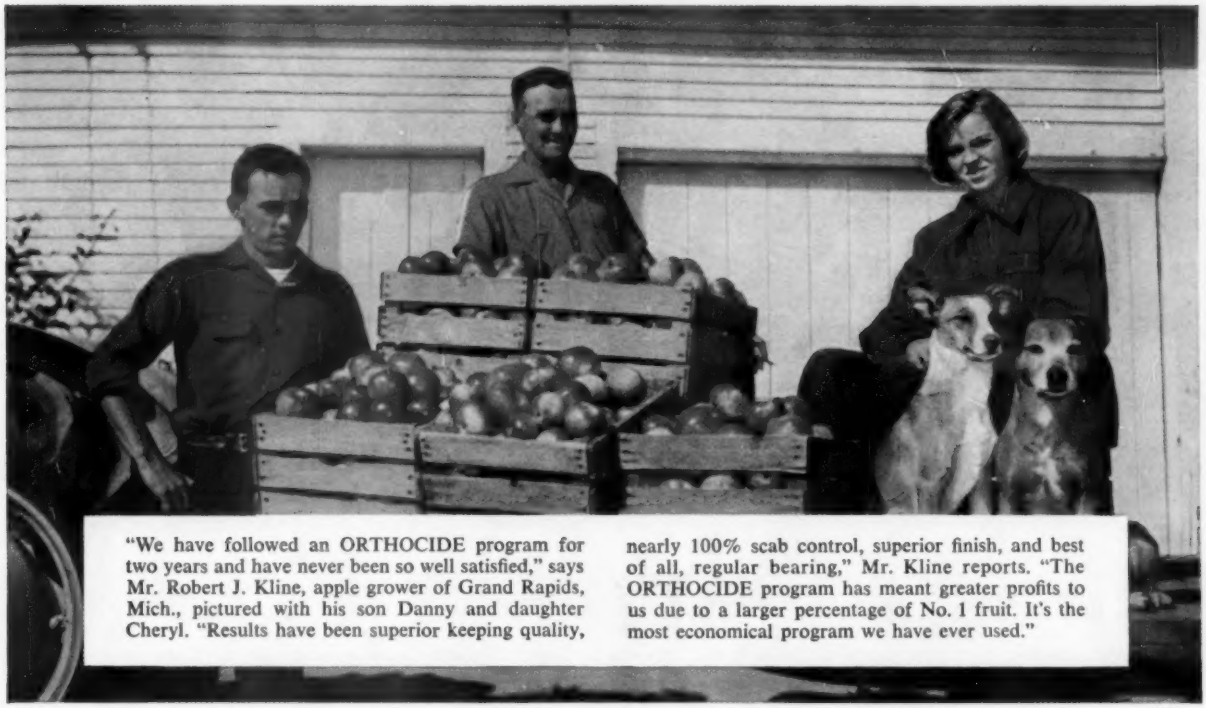
State _____

JOHN DEERE

"WHEREVER CROPS GROW, THERE'S A GROWING DEMAND FOR JOHN DEERE FARM EQUIPMENT"

Growers report on ORTHOCIDE in an ORTHO program:

"MEANS MORE PROFIT" "SUPERIOR FINISH" "SCAB CONTROL" and "MORE NO. 1 FRUIT"



"We have followed an ORTHOCIDE program for two years and have never been so well satisfied," says Mr. Robert J. Kline, apple grower of Grand Rapids, Mich., pictured with his son Danny and daughter Cheryl. "Results have been superior keeping quality, nearly 100% scab control, superior finish, and best of all, regular bearing," Mr. Kline reports. "The ORTHOCIDE program has meant greater profits to us due to a larger percentage of No. 1 fruit. It's the most economical program we have ever used."

Use ORTHOCIDE in a complete ORTHO program for best results

Only ORTHOCIDE, a superior formulation of captan, made exclusively by its developer, California Spray-Chemical Corp., provides: (1) exceptionally fine particle sizes. (2) better sticking, wetting, and spreading agents. (3) superior carrying agents. (4) compatibility with the full ORTHO line of insect and disease control products.

Peach grower says higher market price due to ORTHOCIDE program

"We used an ORTHOCIDE program on our entire 80 acres," says Mr. Art Sowles, peach grower, Kalamazoo, Michigan. "We noted a finer finish on *all* our fruit resulting in higher market quality and price."

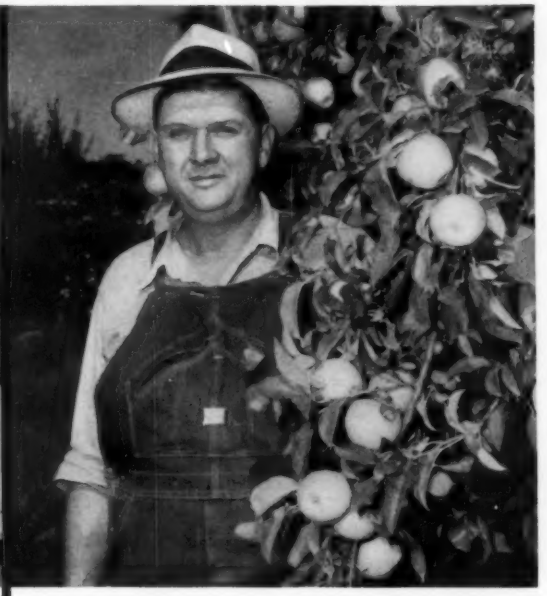
Spraying before harvest controlled decay, mold on cherries

In a test on Bing cherries sprayed before harvest both ORTHOCIDE-sprayed and unsprayed fruit was packed, then stored for 9 days at 40° F., then held at a room temperature for an inspection period of 33 hours, and again placed in cold storage for 7 days at 39° F. In the unsprayed cherries (left) there was 9.33% decay...only 1.33% in the ORTHOCIDE-sprayed cherries (right).

THESE GROWERS PROFITED FROM AN ORTHO® PROGRAM! SO CAN YOU!

Contact your ORTHO Fieldman now!

"This is my third year on the ORTHO program and I have never had as good scab control as I have had these past three years," writes Mr. Louis Lautz, LaCrosse, Wisconsin. "Yields on two varieties have increased at least ⅓ on my larger trees, size and color have been exceptionally good, the fruit has been 99% clean," says Mr. Lautz.



"ORTHOCIDE was the only fungicide used on my orchard this season," reports Mr. Everett Lutz, Lawndale, N. C., President of the North Carolina Apple Growers Assoc. "I have harvested the most fruit and the finest finished crop in my entire apple growing experience!

"By decreasing the number of applications with the ORTHO program, we saved money, got best scab control ever," says Edward and Roscoe Crist (pictured on the left), apple growers of Walden, New York. "ORTHO field service was instrumental in timing of applications for insect and disease control."

Pennsylvania Peach Grower—"Improvement in brown rot was over 130% after using ORTHOCIDE."—Kermit Miller, Rt. 1, Catawissa, Pennsylvania.

Apple, Peach Grower, Virginia—"For scab control and increased yields, ORTHOCIDE is the best fungicide to use in or near the bloom period on apples."—Bonham Bros., Chilhowie, Virginia.

ORTHOCIDE (captan) is manufactured internationally and distributed world-wide by its original developer, California Spray-Chemical Corp.

ORTHO®

For complete details call your nearest ORTHO Fieldman

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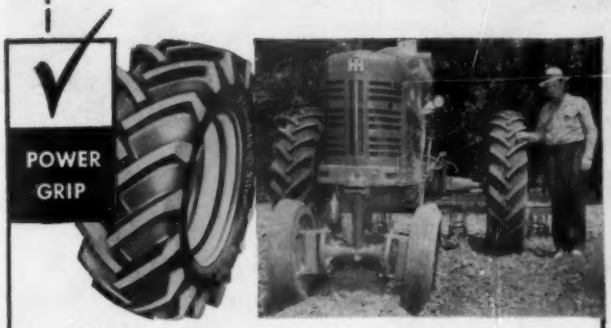
B.F.Goodrich

PRICE SPECIALS on FARM TIRES

during Thrift Tag Sale



53.40* 9-24 4 PLY

SIZE	PLY	PRICE*
10-28	4	72.90
11-38	4	106.15
12-38	6	130.60

*Plus tax and retreadable tire

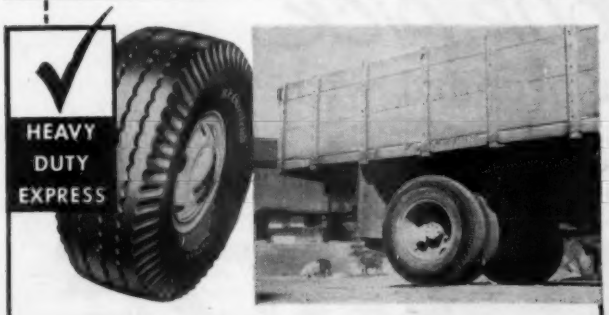
Bigger cleats—bigger shoulders! Comes on new tractors.

42.75* 9-24 4 PLY

SIZE	PLY	PRICE*
10-28	4	58.30
11-38	4	84.90
12-38	4	88.85

*Plus tax and retreadable tire

Same tread design that came on new tractors for years!

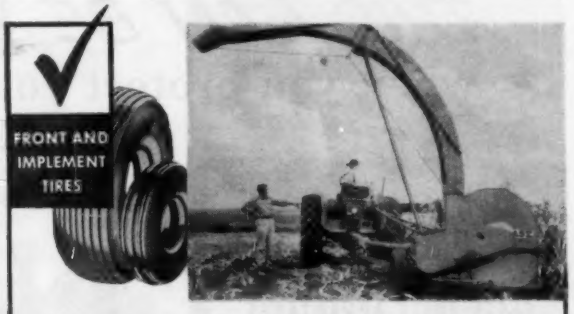


19.95* 6.00-16 6 PLY

SIZE	PLY	PRICE*
6.50-16	6	28.65
7.00-15	6	34.45
7.50-20	8	61.95

*Plus tax and retreadable tire

Same Wonder Tread design that formerly came on new trucks.



11.90* 4.00-15 4 PLY

*Plus tax and retreadable tire

B.F.Goodrich front tractor—full size, fully guaranteed.

All 4-ply tires

SIZE	PRICE*
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6.00-16	16.55

12.25* 4.00-12 2 PLY

*Plus tax and retreadable tire

Grooved Implement—for all implement and trailer free-rolling wheels.

All 4-ply tires

SIZE	PRICE*
6.00-16	18.90
6.50-16	20.45

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USED TIRES

Big selection for cars, trucks, implements and tractors.

Prices start at only **2.95**

NEW TREADS

For cars, pick-up trucks, wagons.

Prices from **11.70** 6.70-15

Plus tax and retreadable tire

CROP PAYMENT TERMS AVAILABLE on all tires

Look for the THRIFT TAG at your B. F. Goodrich dealer's

B.F.Goodrich FIRST IN RUBBER

Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

THIS CAN BE YOUR PICK

when you protect your orchard with

WHEN YOU BUY Niagara YOU BUY PROTECTION

NIACIDE

CHECK THESE ADVANTAGES

- Better Colored Fruit
- Finer Finish
- Improved Keeping Qualities
- Non-Spotting
- Non-Toxic To User
- Compatible With All Insecticides
- Widest Range of Control

An Exceptional New Fruit Fungicide, Merit Proven!

After several seasons of commercial tests, Niagara's Niacide is now available for every grower's use and benefit.

Niacide is an exceptionally mild fungicide. It leaves no objectionable spots on either fruit or foliage. Unlike some of the newer organic chemicals, it can be applied safely to *all varieties* of apples, including Red Delicious and Baldwins. And its use will actually improve keeping qualities of apples for storage.

Niagara Niacide offers the widest range of control over scab and other fungus diseases. In test orchards it has uniformly upgraded harvests by producing fruit of highest color, finest finish.

Now you can profit from these many benefits. See your Niagara field man or write for literature.

Niagara CHEMICAL DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION

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American Fruit Grower
• Fruit for Health •

It is important to collect leaves properly. They should be taken from the middle of the current season's growth during July and early August.

10 Questions and Answers on LEAF ANALYSIS

What you should know about this important new tool to help you better feed your trees

By A. L. KENWORTHY
Michigan State University

WHY should I be interested in leaf analysis?

Even though a soil is well supplied with fertilizer, the tree may not be getting all the nutrients it needs. By testing the leaves for nutrients it is possible to tell how well the tree is being supplied.

Through leaf analysis, deficiencies can be avoided and the improper use of fertilizer prevented. We have had cases in Michigan where boron applications were planned because Delicious trees showed measles. However, leaf analysis showed that it was not boron deficiency but manganese toxicity. In other cases, magnesium sprays were planned, but leaf analysis showed the need for potassium instead.

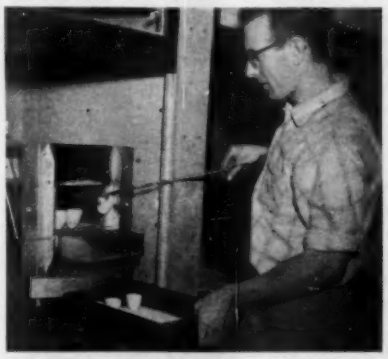
Also, leaf analysis tells when to discontinue the use of certain fertilizers, and often the direct savings on the fertilizer cost are substantial. In other cases, fertilizer costs are temporarily increased. In both cases better tree performance may be expected.

How are the leaves analyzed?

The post-war development of the spectrograph has made it possible to analyze leaves rapidly and effectively. Leaves are first dried and ashed. Then the leaf ash is burned with a high voltage electric arc. This causes each of the elements to produce a characteristic light that shows on a photographic plate as a narrow dark band. The amount of light produced by the element tells how much is present.

What is the standard of values and why is it so important?

The standard values are based on analysis of leaves from good trees.



Before being analyzed spectographically leaves are reduced to ashes at temperature of 1022° F.

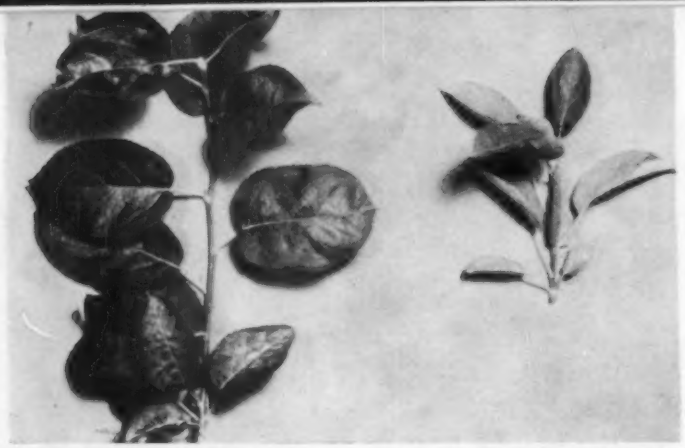
The analyses from your leaves are compared with the standard leaves in order to determine which elements are in oversupply or undersupply.

The author directs the preparation of the nutrient-element Balance Chart to be sent to grower.

There may be considerable variation between regions in the level of nutrients found in the leaves but there is little regional variation in the basic levels of nutrients needed for good tree growth. For instance, leaf analysis values for potassium and magnesium are essentially the same for all regions and countries.

If you were to send in leaves to be analyzed for which no standards are available, it would be necessary to send in a sample of leaves from a good plant as well as a poor plant in order that comparisons can be made.

(*Continued on page* 46)



Nitrogen deficiency in apple. Deficient shoot on right shows small light green upright leaves with basal leaves showing the deficiency most. Note short thin shoot.

Correcting NUTRIENT DEFICIENCIES

Be sure your fruit trees are getting a good basic diet—but don't overlook the all-important trace elements

By NORMAN F. CHILDERS
Rutgers University

THE key nutrient for deciduous fruits over the United States is unquestionably nitrogen. There are a few sections of the country, such as the San Joaquin Valley in California, where 30-year orchards have never had a pound of nitrogen, only zinc sprays, but these areas are limited.

In regions where rainfall is at least 15 to 20 inches, and particularly if the soil is sandy, there is sufficient leaching of the soil to reduce the available nitrogen supply to the deficient level for most fruits. Commercially, nitrogen is the key nutrient used to control growth and fruiting. The other nutrients, such as potash, magnesium, zinc, and boron, are supplied, if needed, in adequate quantities to prevent deficiencies from occurring.

Next to nitrogen, the most important nutrients in deciduous orchards over the country as a whole are potash, magnesium, and boron. Zinc, iron, and manganese have importance in the West in certain areas and in some sandy soils of the East. Some irrigated areas of the West have an added problem of excess boron.

Magnesium is becoming more widely recognized as a deficient nutrient in deciduous orchards in humid areas. Nitrogen, potassium, magnesium, and boron are all readily soluble and thus tend to be leached in areas where annual rainfall is at least moderate—30 to 50 inches.

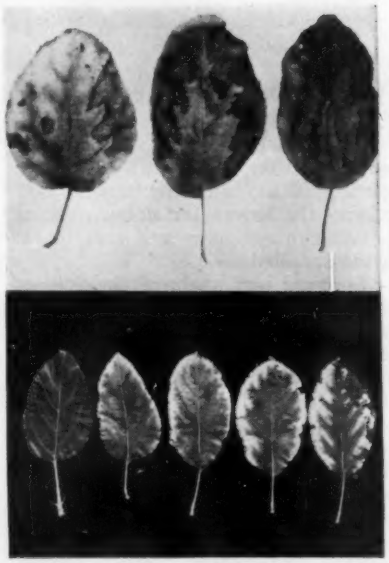
Boron may be found to be deficient in the West, however, where rainfall is no more than 10 inches a year. The deficiency is created by a relatively high pH of the soil which tends to tie up the boron, making it unavailable to the trees. This also can happen with other minor elements, such as zinc, iron, and manganese.

As yet there has been no report of molybdenum deficiency in deciduous orchards in the United States. This statement also holds more or less for copper. Field investigations at Rutgers and Michigan State universities are now under way with these latter nutrients to explore needs, if any.

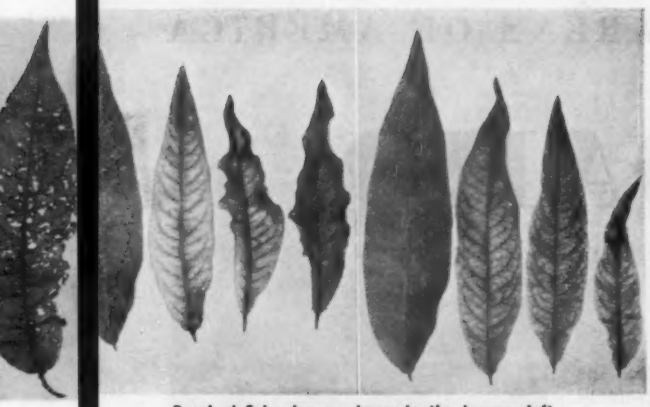
If zinc and manganese deficiencies occur in fruit trees growing in sandy soils in humid areas, they can be corrected either by applying sulfate forms to the soil (the preferred method; see below), or quicker response can be obtained by sprays. A spray of 2 to 5 pounds of manganese sulfate, such as Tecmangan (Tennessee Corporation, Atlanta, Ga.) is applied preferably when foliage is young to medium age.

Zinc is generally caustic to foliage and is usually applied as a dormant spray at from 5 to 50 pounds per 100 gallons just before the buds break, depending upon severity of deficiency and the crop. Zinc deficiency is more difficult to correct on sweet cherry than apple.

In desert areas where soil pH is moderately high and these nutrients are tied up, either dormant or foliar



Magnesium deficiency in McIntosh apple (top group of leaves) and Golden Delicious. Interveinal and marginal necrotic areas on McIntosh, usually at midseason or later, causing leaf and fruit drop. Left leaf shows interveinal and marginal yellowing. On Golden Delicious and Delicious, marginal and interveinal yellowing of older leaves may appear on shoots and spurs. Certain other varieties may also be so affected.



Peach deficiencies as shown in the leaves, left to right: POTASSIUM deficiency—note necrotic spotting between the veins and marginal scorch; MANGANESE deficiency—marked symptoms show less green next to main veins; necrotic areas have dropped out; ZINC deficiency—normal leaf at left; others show dull white chlorosis up to green main veins, leaf curl with wavy margins; IRON deficiency—chlorosis on Elberta peach; note network of green veins on a yellowish background. Normal peach leaf is at left.

McCormick-Deering W-9 pulling ground-driven fertilizer distributor in Lake Wales citrus grove.

Boron-deficient peach tree in spring in British Columbia, showing dieback of shoot tips and new growth appearing below. Bushy appearance of shoots is result of shoot tip dying and new shoots developing below the dead tips.

spraying or daubing the pruning cuts (grapes) is the best approach for deficiency correction, following the local state experiment station's recommendations.

Iron chelate, according to manufacturers' suggestions, is showing most promise in the West as a foliar spray for correcting iron deficiency in high pH desert soils.

In the East, where the organic matter content is low in some of the sandy soils, boron, zinc, iron, and manganese

(*Continued on page* 57)

Fertilizing

FLORIDA CITRUS

Florida's soil lacks about everything trees need—but good fertilization supplies what's missing

By HERMAN J. REITZ
University of Florida

FEW crops are grown on soil as naturally infertile as is the Florida citrus crop.

Selection of orchard sites has been dictated almost entirely by the necessity of obtaining satisfactory air drainage for cold protection. Such sites in Florida afford only coarse-textured sands of almost negligible fertility.

Under these conditions, deficiencies of nitrogen, potassium, magnesium, manganese, copper, zinc, iron, boron, and molybdenum have been identified in citrus trees. Sulfur and calcium deficiencies would probably be found if these elements were not incidentally included in the general cultural program. In short, the soils on which citrus is planted in Florida are often deficient in nearly all elements known to be essential to plants except those obtained from air and water.

Before 1930 most central Florida citrus groves were severely deficient in magnesium and sometimes a number of other elements. Considerable research has been conducted, with the result that today it is difficult to find good examples of deficiency symptoms in commercial groves. In fact, the research program for the development of further improved nutritional practices is at times severely handicapped by lack of deficient trees on which to conduct experiments.

Soils in the citrus area contain almost no clay, and the low exchange capacity they possess comes almost entirely from organic matter. Fertilizer nitrogen and potassium are held weakly by the soil and remain highly soluble.

The leaching of magnesium, boron, and phosphorus is related to soil pH. These elements leach readily when the pH is below 5.5, but phosphorus usually does not move below the rooting zone. In more heavily limed soils the downward movement of magnesium and boron is greatly retarded, and little downward movement of phosphorus occurs.

Most of the heavy metals (copper, zinc, and manganese) applied to the soil are fixed by the organic matter in the top few inches.

Copper is held more tightly than either zinc or manganese; however, the trees require only 3 to 4 ppm of copper in the foliage, and it is believed that sufficient copper can be supplied through the soil.

It has not been feasible to apply zinc fertilizer to the soil, and this element is supplied entirely in foliage sprays.

Manganese is applied both to the soil and in foliage sprays. Soil applications are generally effective if the soil pH is below 6.0. If the

(*Continued on page* 55)

Picking apples near Fruitland, Idaho.

THE FRUIT AREAS OF AMERICA

IDAHO

By ANTON S. HORN
University of Idaho

This is the tenth in a series of articles on important Fruit Areas of America. Previous "fruit tours" have taken us to New Jersey; East of the Cascades in Washington; California's Central Valley; the Ozark region of Missouri, Arkansas, and Oklahoma; New England; the Lower Rio Grande Valley of Texas; Western New York, Georgia, and Appalachia.—Ed.

WHEN you see a highly colored Red Delicious apple with just the right flavor, you say "Idaho" without looking at the label.

Anytime you see a group of Idaho fruit growers you can get a conversation started if you are familiar with the new red sports of Delicious. They are planting the best they can find. And if you know of a new one that is better than what they have, they are all ears. They want an apple redder and better.

Most of the so-called standard Delicious have been pulled out and replaced by red sports, namely, Starking, Richared, Royal Red, and Red King. This is substantiated by the 1956 Fruit Tree Census that lists 117,408 trees of the red sports of Delicious, and 54,656 of those are of bearing age. Of the common or standard Delicious only 18,117 trees are left, according to the census, and 17,560 are in bearing, indicating that practically no standard Delicious trees are being planted.

Both Golden Delicious and Jonathan are used as pollinators for Delicious. If the grower is located on an early site, he chooses the red sports of Jonathan — either Jonared or Blackjon. If the site is extremely early, he will plant a block of Jonared or Blackjon. Early Jonathans of high color command a good price.

If he is too late for a good Jonathan market he will plant Golden Delicious as a pollinator. The "Goldens," as they are called, do very well and are free from russet in and around the cavity. This is true in Idaho orchards most years. The Goldens total 7323 trees and 2864 are bearing fruit. There are 31,460 Jonathans and 30,278 are of bearing age. Of the red sports of Jonathan, 33,702 is the total tree number with only 16,861 of bearing age.

The Idaho grower generally plants Rome Beauty, the old mortgage lifter that can be depended on for a crop on sites most likely to frost. This late bloomer and high yielder is preferred in the color sports. Standard Romes total 27,242 trees, of which 24,753 are of bearing age. The red sports of Rome total 52,420, with 20,727 in bearing. There are a few Winesap orchards left, but very few trees of that variety are being planted. There are practically no other varieties grown because the Idaho grower's markets are at a distance and he has always planted the varieties he could sell for profit.

The commercial apple crop averages 1,583,000 bushels. It rose to 1,630,000 bushels in 1955, is estimated at 1,600,000 bushels for 1956. Southwestern Idaho, where most of the fruit is raised, is free of apple scab, but growers do have to fight mildew on Jonathan and Rome.

Apples in filled crates being moved out of an Idaho orchard by means of a fork-lift.

More and more culls are being processed. Applesauce is made at Emmett and New Plymouth.

Blossom thinning with Elgetol coupled with good soil management, judicious pruning, and proper spraying has eliminated biennial bearing in many orchards.

There is a small acreage of Bartlett pears of about 47,955 trees with

Looking out over the Emmett Valley from Freezeout Hill.

The author, Tony Horn, looking at a Stanley plum tree located near Homedale, Idaho.

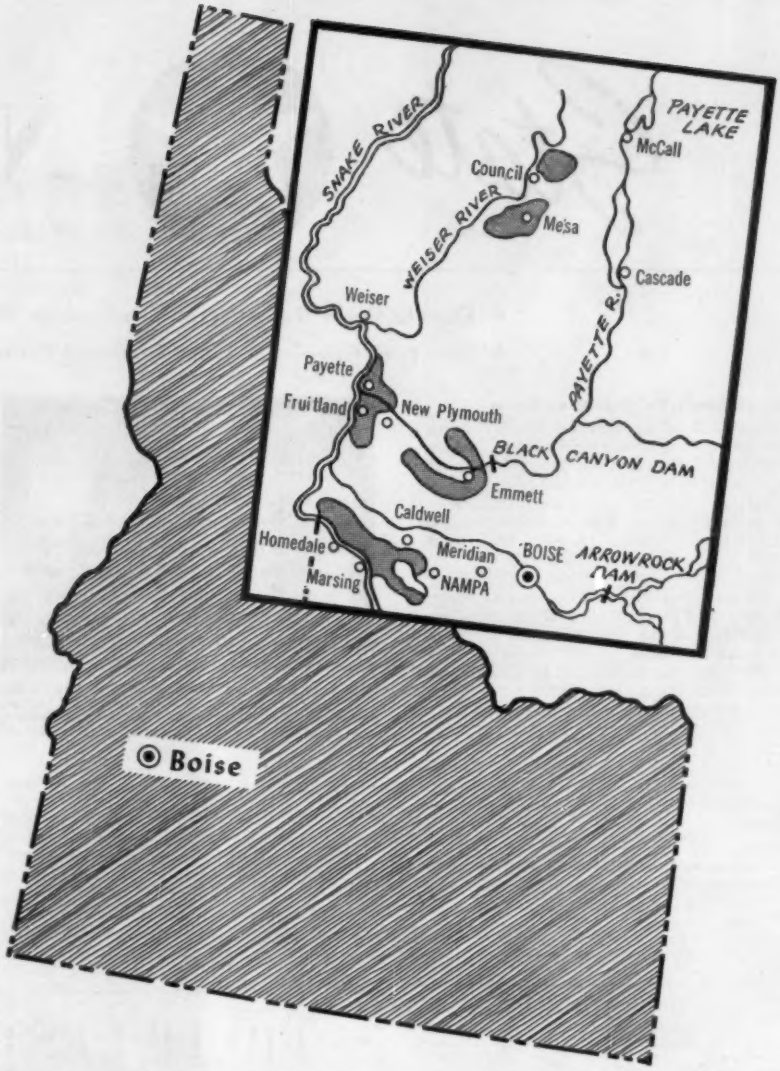
30,011 in bearing. The pear crop averages about 67,000 bushels. Bartlett is the principal variety grown. Fire blight is controlled by blossom sprays of weak Bordeaux and various proprietary copper sprays.

One could write a book about the Italian prune. No other fruit is as fickle as this one. There are 331,336 trees of this variety and 316,406 are in bearing. Early Italian types such as Demaris and Richards also are grown. A limited acreage of the Stanley plum is planted. The Brooks Italian prune is also being tested. The large plums coming from Idaho late in the season are the President variety. They have to be thinned to get good size while the Italian prunes do not need hand thinning. A total of 37,862 President plum trees have been planted and 35,510 are in bearing.

Idaho peach growers prefer the J. H. Hale peach. This variety is especially well adapted to our area. We believe as grown in Idaho, our peaches will carry riper than those grown in some of the other areas. Elberta and Gold Medal are also grown. J. H. Hale needs a pollinator even under our conditions and the Gleason strain of Elberta is generally planted for this purpose.

Many of the peaches were shipped out in three-quarter bushel baskets. Last year's light crop was 270,000 bushels. The 1955 crop was heavy; it totaled 500,000 bushels.

The best of the sweet cherries—Bing, Lambert, and Royal Anne—are grown. Pollinators for these are the Black Tartarian, Deacon, and Van. There is a total of 63,428 sweet cherry trees, of which 61,147 are in bearing. Sweet cherry production was reduced somewhat by the November 15, 1955, freeze.



The fruit areas are shown by shaded portions of insert in map showing southwestern Idaho. Fruit areas are located on the higher ground around cities, lakes, and rivers, in rather definite areas.

Apricots are a thing of the past. There are a few apricot orchards left and no one plans to set out more apricots.

Most of the fruit produced is consumed outside the state. If you were standing at a crossing waiting for the 1646 cars of Italian prunes shipped from Idaho in 1956 to go by at 40 mph, you would have to wait 21 minutes and it would take about 14 Diesels to pull the 14-mile long string of cars. Thank goodness that they are not all shipped the same day. Depending on how they are loaded, there are either 864 or 848 one-half bushels per car. Each packed basket weighs 28 pounds. The prunes are shipped as far as Pennsylvania and New York and considered a delicacy on the market.

Sour cherries sold to the canneries totaled 1400 tons in 1955 and 900 tons in 1956. Good strains of the Montmorency are grown. Commercial fruit production is limited mainly to the Boise Valley. Most of the production is near Caldwell, Nampa, Wilder, Homedale, Emmett, Fruitland, Payette, Weiser, Mesa, and Council.

Even though fruit has given way to other crops, there are still some good orchards near Meridian. Twin Falls, Buhl, Hagerman, and in northern Idaho near Lewiston. There are a few orchards near Hope on Pend Oreille Lake in the extreme northern tip of the state.

Idaho orchards are in the hands of experienced growers and most of the growers plan to turn their orchards over to their children.

New land is being sought for orchards and to escape late spring frosts high land is preferred. A number of growers have purchased desert land "above the irrigation canals" and are irrigating from wells.

Fruit growing is adapted to the areas of Idaho where it is now grown and the growers are enthusiastic about the future. THE END.

State NEWS

- **Florida Court Rules Against Bulldozing Diseased Citrus Trees**
- **New York Growers Want Thicker and Better Fruit Pies**

Court Stops Bulldozing of Trees

FLORIDA—The method of eradicating the burrowing nematode by destroying citrus trees affected with spreading decline has been halted due to a ruling by the Florida Supreme Court that it is illegal to destroy a grower's trees without compensating him. (See pg. 15, Feb., 1957, AMERICAN FRUIT GROWER, "Battle in the Citrus Grove.")

Spreading decline is a serious menace to central Florida where 27 counties have found burrowing nematodes in citrus and ornamental plants.

Plant board workers have already bulldozed trees from nearly 3300 acres of land and fumigated to kill the nematodes in the hope that the land can be reset to trees in two years.

State Attorney General Richard Ervin intends to ask the court to review its decision but in the meantime bulldozing operations have stopped.—*J. Francis Cooper.*

COLD SNAP HURTS FRUIT PROSPECTS

Unusually low temperatures in January did severe damage to fruit crop prospects in several states.

In New York it is expected that the 20- to 25-degree below zero temperatures wiped out bumper sweet cherry and peach crops. New York's peach crop had a potential of one million bushels and the loss could amount to more than $2 million. Grapes and blackberries in the Finger Lakes region also were hurt.

January cold spells have killed practically all peach fruit buds in Massachusetts, and there is considerable wood injury. Plums and cherries were also hurt.

In Yakima, Wash., on 14 of the last 15 days of January, temperatures were zero or below and on January 27 the temperature dropped to 19 below. Peach buds were seriously damaged with possibilities of not more than 25% of a crop. Apricots were also hurt but a fair crop is expected.

In central Indiana, at Lafayette, temperatures of minus 15 and minus 13 eliminated most or all of the peach crop for 1957. There was some peach-bud kill in both northern and southern Indiana peach areas, but there are still plenty of live buds for a crop on the fair to better peach sites.

New York Meetings

NEW YORK—"Total savings of 10 to 12 cents a crate can be made through the use of bulk boxes," Harold P. Gaston of Michigan State University told growers attending the 102nd annual meeting of the New York State Horticultural Society in Rochester in January.

Gaston went on to say that special equipment is needed for efficient handling of bulk boxes. This includes 1) fork lift at the unloading dock (in Michigan 300 growers have fork lifts at the dock); 2) a tractor lift in the orchard or a three-point hitch on the tractor to pick up bulk boxes; 3) dumping equipment—and there are recently developed dumpers, not too expensive, which do a good job; and 4) if selling apples to the processors, the processor needs fork-lift trucks and dumping equipment also.

New cost-saving equipment for growers was also discussed by a panel led by Tom Lamont, of Albion. The panel included

New York State Horticultural Society officers for 1957 are, left to right: Rolland Reitz, Rochester, president; Dan Dalrymple, Lockport, secretary, and Ralph Smith, Poughkeepsie, vice-president.

George Collamer, of Hilton; Cam Garman, of Burt; and DeForest Fowler, of Wolcott.

The panel agreed that power pruners were important laborsaving equipment and estimated the cost of a 17 cubic foot compressor with two guns at around $500.00.

On the use of a rotary cutter to chop brush, spread mulch, and mow the orchard, the panel was agreed that the rotary cutter is an indispensable piece of equipment. The panel also told about the use of a tree tiller or hoe and its ability to till around 500 to 800 trees a day. It is necessary to attach the tree tiller to a tractor which will make short turns.

Speaking before the annual meeting of the Western New York Apple Growers Association, Ralph A. Bunje, manager of the California Canning Peach Association, urged growers to strive for the bargaining power enjoyed by big labor and big business. He cited the operation of farmer-controlled bargaining associations as one of the means that has proved successful in achieving a fair price.

Steve Putnam, of Lockport, secretary-manager of the Lake Ontario Fruit Growers Co-operative, said that fruit growers must meet the trend toward fewer and larger buyers by organizing for mass selling.

By resolution, New York growers came out strongly in favor of thicker and better fruit pies. Saying that in many instances fruit pies are made with the very minimum of fruit in them, the resolution asked that specialists at Cornell University develop proper standards for quality and quantity in pie filling.

(*Continued on page* 56)

FRUIT PEST HANDBOOK

(FIFTY-SEVENTH OF A SERIES)

GREEN PEACH APHID

A PEST of many hosts throughout the United States, the green peach aphid sometimes occurs in large numbers in the opening blossoms of peaches. It may cause serious crop losses by sucking the juices from the newly formed fruit, causing it to drop. It also curls the leaves and prevents them from developing normally. Plums, prunes, and other stone fruits are also hosts.

The green peach aphid overwinters on peach in the egg stage, the shiny black eggs being deposited on the twigs, in the axils of the buds, and in crevices in the bark. The eggs hatch early in the spring and the pinkish young begin feeding at once on the opening buds.

The nymphs develop into wingless females or stem mothers that produce succeeding generations. These are light green and feed on the undersides of the leaves, where they may occur in large numbers. After two or three generations on peach, winged forms are produced that migrate to summer food plants. These include many common vegetables, tobacco, and ornamental plants. In the fall, winged forms return to peach and produce a wingless generation that lays the overwintering eggs.

***Control.* Spray the trees with an oil emulsion spray containing 4% oil just as the buds begin to swell or with 2 pounds of a 25% malathion wettable powder, 1 pound of 15% parathion wettable powder, or ¾ pint nicotine sulfate with a small amount of soap or casein spreader in 100 gallons of water, when the aphids first appear.**

Do not use parathion unless you observe all precautions recommended for handling and use.—Howard Baker, USDA.

Close-up of green peach aphids on leaf.

Green peach aphids on pear leaves. Leaves have begun to curl and become deformed.

Photographs courtesy USDA.

Meet the tree that almost met a bulldozer

. . . saved by Versenol Iron Chelate

Not long ago, this tree was tagged to be torn out by a bulldozer. Its leaves had yellowed and dropped . . . limb by limb it was dying. And all it lacked was iron!

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Of course, orchard men no longer wait for dieback to show them the need for iron. At the first sign of yellowing, Versenol Iron Chelate is used to cure iron deficiencies.

Keep your orchard in good, green health. Use Versenol Iron Chelate in concentrated form for mixing with water or liquid fertilizers. Get Versenol Iron Chelate on Vermiculite for direct application . . . or with dry fertilizers. Your Dow dealer—or fertilizer formulator—will furnish additional information. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Dept., Midland, Michigan.

WEED AND BRUSH KILLERS, SOIL FUMIGANTS, GRAIN FUMIGANTS, INSECTICIDES, IRON CHELATES, FEED ADDITIVES, ANHYDROUS AMMONIA, DEFOLIANTS.

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Enlarged lenticels such as these are usually indicative of unfavorable growing conditions.

Diagnosing TREE ILLS

Your trees tell you their needs —if you know what to look for

By C. H. BLASBERG
University of Vermont

FROM one year to the next, the same fertilizer program in the same orchard can produce very different results.

This is so because factors other than the kind or amount of fertilizer applied very often have a more profound influence on tree response. Take, for example, the varietal response to temperature.

It has been established that such varieties as Stayman, Rome Beauty, Jonathan, Winesap, and York Imperial grow to better perfection in the southern apple growing districts, whereas such varieties as McIntosh and Baldwin require the cooler temperatures prevailing in the northern sections. These differences, along with others, must be reckoned with in planning a nutritional program.

Know Your Trees

To help diagnose your own orchard problems, perhaps a few clues as to what to look for may be helpful. The record may be found on the trees. We will assume that the site factors are satisfactory. If not, perhaps the best advice would be to abandon the trees and start over on a favorable site.

1) Are the trees well developed for the variety, considering age and size?

2) Do trunks or limbs show signs of disease or injury?

3) What is the planting distance and pollinator situation?

4) What have been the past cultural practices? Some of these you can readily see, such as extent of

(*Continued on page 22*)

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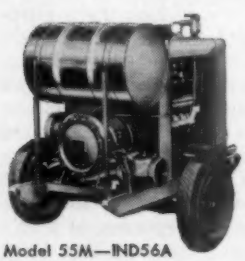

Model 55M—IND56A

Pictured is Mr. Kenneth Dennehy of General Irrigation Co., Warehouse Point, Conn., who sells Gorman-Rupp Irrigation Pumps.

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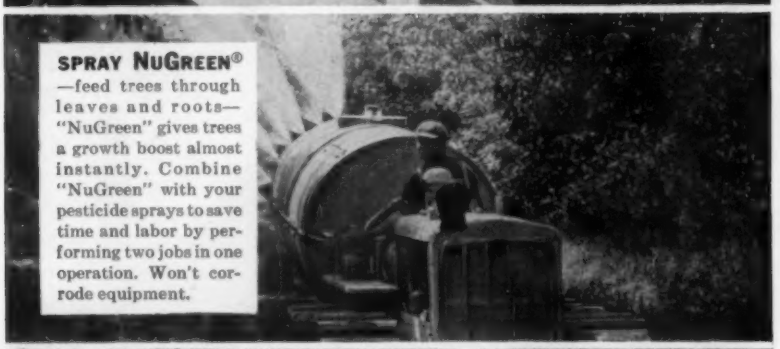
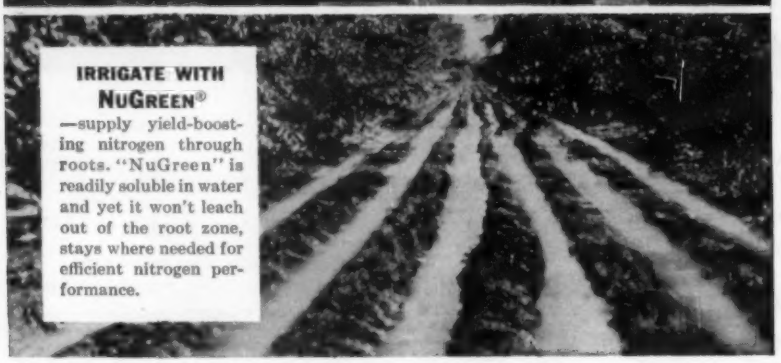
SPREAD NuGREEN®
—feed nitrogen at the rate needed for steady, season-long growth and top yields of high-quality fruit. It's concentrated, 45% nitrogen . . . resists leaching and is readily available. And "NuGreen" aids decay of plant residues and cover crops.



SPRAY NuGREEN®
—feed trees through leaves and roots—"NuGreen" gives trees a growth boost almost instantly. Combine "NuGreen" with your pesticide sprays to save time and labor by performing two jobs in one operation. Won't corrode equipment.



IRRIGATE WITH NuGREEN®
—supply yield-boosting nitrogen through roots. "NuGreen" is readily soluble in water and yet it won't leach out of the root zone, stays where needed for efficient nitrogen performance.

You gain with Du Pont "NuGreen" because it feeds nitrogen for higher yields of better fruit and can be applied efficiently by whatever method best suits your operations. You save time and labor with "NuGreen" because you handle less material per unit of nitrogen applied. "NuGreen" comes in 80-lb. bags—in free-flowing shot form. Order your supply of Du Pont "NuGreen" soon . . . it's your best buy in supplemental nitrogen.

E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington 98, Del.

DU PONT
REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

NuGREEN®
FERTILIZER COMPOUND
—it's concentrated 45% nitrogen

DIAGNOSING TREES

(*Continued from page* 20)

pruning, extent of mulching, and sod vs. clean culture.

5) What has been the character of growth? Consider terminal length and diameter; leaf size, thickness, condition, and color; color of bark and twigs; size, number, and distribution of fruit buds, and proportion of fruit spurs to shoots.

6) Were such factors as fruit color, size, finish, and flesh firmness satisfactory?

Extension workers are constantly being called upon to make recommendations. These are necessarily of a very general nature. Any grower would be well-advised to use them only as a guide and work out his own requirements.

We strive to convince our growers to fertilize their trees liberally and regularly. Nitrogen is deficient in most of our soils unless applied annually. From the standpoint of the welfare of the tree, nitrogen deficiency is not serious. It may have serious consequences for the grower.

Working drawings of an inexpensive Plastic Greenhouse, prepared by the University of Kentucky, together with descriptive leaflet, may be obtained for 25 cents in coin or stamps from AMERICAN FRUIT GROWER, Willoughby, Ohio. Plans of the Cornell plastic greenhouse with sliding plastic roof panels are also included.

A deficiency of potash, magnesium, or boron is very drastic in its effects upon the tree. Even an incipient deficiency may be serious to the welfare of the tree as well as costly to the grower. Nitrogen is readily leached, but the more nitrogen applied, the sooner a tree may produce potash deficiency symptoms. Heavy applications of potash may lead to magnesium deficiency. We must find ways to obtain greater control of growth responses.

Foliar Nitrogen Sprays

Foliar application of nitrogen (urea) is a step in this direction. It provides nitrogen early in the growing season, is immediately available, and dissipates quickly, causing little interference with fruit color unless applied very late in the growing season.

We have come to look upon nitrogen as the regulator of plant growth. There are, however, many other factors which may influence the nitrogen balance of your trees. I am thinking particularly of such things as ground cover, pruning practice, spray practices, amount of soil moisture, an excess or deficiency of other nutrients, and injuries to root branches or leaves as well as climatic factors. THE END.

If conditions in the field are just too much for the ordinary pickup you're using, then the INTERNATIONAL Model S-120(4x4) is the answer! Four-wheel-drive, full-size cab and body, 7,000 lbs. GVW. Choice of three pickups, two stakes, and Travelall® body.

The farm truck that makes its own roads costs least to own!

When the going gets tough, that's when the INTERNATIONAL light-duty four-wheel-drive truck really begins to show its stuff.

Ideal vehicle for *all* general farm hauling or stationary power jobs. Wade through mud, snow, sand to any job. Power take-off, optional winch and generator make it a power plant on wheels. Backhoe or scraper blade available for even greater versatility.

On the road, this model S-120 (4x4) handles with the kind of ease you'd expect of a passenger car.

With all these features, you'll find INTERNATIONAL Trucks cost *least* to own. Cost records of fleet owners—whose trucks roll millions of miles a year—prove it!

Stop in and see your INTERNATIONAL Truck Dealer today.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL® TRUCKS

Motor Trucks • Crawler Tractors • Construction Equipment
McCormick® Farm Equipment and Farmall® Tractors

KILL FUNGI
with
PHYGON-XL

You get cleaner fruit, better yield with this low-cost killer. Phygon®-XL, the orchard fungicide, can sizably increase this year's peach profits at very little cost to you. This easy-to-use fungus killer gives excellent control of bitter rot, California blight, peach leaf curl, brown rot and blossom blight and many other diseases.

Remember, Phygon-XL is the cheapest, most effective fungicide available, not only for peaches but for apples as well, for it controls apple scab and bitter rot. Harmless to pollen and bees, does not affect odor or flavor of fruit.

Order Phygon-XL from your local supplier today. Write, wire or phone us if unable to locate immediate source of supply.

United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

producers of seed protectants, fungicides, miticides, insecticides, growth retardants, herbicides: Spergon, Phygon, Aramite, Synklor, MH, Alanap, Duraset.

NITROGEN Fertilizer Facts

Here are important facts on three commonly used forms of nitrogen

By JAMES M. BEATTIE

Ohio Agricultural Experiment Station

WHICH nitrogen fertilizer is best for you?

In making your selection, consider cost, handling ease, effect on soil reaction, the form in which nitrogen is supplied, and the length of time following application before nitrogen is available to the crop. Three sources of nitrogen often used in fruit plantings are ammonium nitrate, sodium nitrate, and sulfate of ammonia.

The cost per ton varies with availability. The only sure way to compare these three sources of nitrogen on a cost basis is to obtain current price quotations and actually calculate the cost per unit of nitrogen. Remember that nitrate of soda contains about 16% nitrogen, sulfate of ammonia about 21% nitrogen, and ammonium nitrate about 33% nitrogen. The guaranteed analysis can always be found on the fertilizer bag or, in the case of bulk purchases, can be obtained from the dealer.

The application of a simple formula will permit you to calculate the cost per pound of nitrogen:

The cost per ton, divided by 2000 times the nitrogen content expressed decimally, equals the cost per pound of nitrogen.

For example, if sulfate of ammonia sells for $82.00 per ton, and the guaranteed nitrogen content is 20.5%, the formula works thusly: $82.00 divided by 2000 times .205 (which is 410) equals 20 cents per pound of nitrogen.

Handling Ease

What about handling ease? This involves at least two things. First is the physical condition of the fertilizer product. This determines the ease with which it may be stored, loaded, and spread. Second is the actual weight of material which must be handled in order to apply the necessary amount of nitrogen.

There can be no disagreement over the second point. Ammonium nitrate contains the highest percentage of nitrogen of these three materials and, therefore, you need to handle fewer total pounds of fertilizer to apply the same amount of nitrogen. One easy way to keep this in mind is to remember that about the same amount of nitrogen is supplied by 1 ton of sodium nitrate, ¾ ton of sulfate of am-

(*Continued on page 26*)

Never-say-die dependability! Proved on the Alcan Highway!

You get famous Chevrolet dependability in whatever model you choose. Ask your Chevrolet dealer about the Alcan Champ best suited for your farm hauling job. It's ready right now to save you time and money.

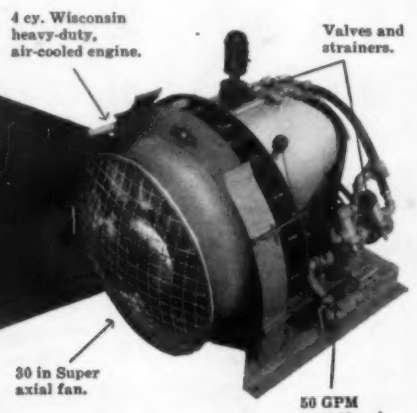
Six new Chevy trucks tamed the rugged Alcan Highway in one round-the-clock sprint (supervised and certified by the AAA). They covered the grueling route in less than 45 hours to prove their durability (normally a 72-hour run)!

Up towering grades, through washouts, clouds of dust and pounding gravel—these Task-Force huskies tested every component on the Alcan Highway and came through with flying colors! As a special test, two of the engines were not stopped once during the entire trip. Gas mileage ranged up to 18.17 miles per gallon! Put an Alcan-proved Chevrolet truck to work on your farm. No job's too tough for these champs! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

The "Big Wheel" in trucks

CHEVROLET

New Task·Force 57 Chevrolet Trucks



BUILD YOUR OWN AIR-BLAST SPRAYER

Save $1,000— with Bes·Spray 'Power Package'

'Power Package' is a *complete* air-blast sprayer (less tank and trailer) —4 cy. Wisconsin heavy-duty, air-cooled engine; 30 in. super axial fan; 50 GPM centrifugal pump; valves and strainers; and agitator sprocket. It's the same fan, pump, engine, valves and strainers built for the famous Bes·Spray model 450 the past three years.

Save hundreds of dollars this Spring*... just attach the Bes·Spray 'Power Package' to any of the following:

- a tank and trailer built to your own specs by your local welding shop,
- a good used sprayer tank and trailer,
- your own rig—built in your barn!
- an old pick-up truck,

***Only $1,695 f.o.b. Oakland – slightly higher from key dealer and warehouse stocks in principal fruit-growing areas of Midwest and East.**

The Powerful New SUPER BES·SPRAY Model 580 for 1957

More Air ... More Horsepower ... Bigger Fans

New, powerful Ford engines (Heavy-duty 4's, 6's, and V-8's) and bigger fans give the big new BES·SPRAY faster coverage, more air volume at lower engine speeds... greater economy! Some models can be equipped with air-cooled engines.

6 New Models

...from 200 to 500 gal. tanks ...from 20 to 80 gal. per min.
...plus protective coated tanks

BESLER CORPORATION

4053 Harlan St. Emeryville, Oakland 8, Calif.

Send complete information on:

☐ **'Power Package'** ☐ **New Bes·Spray**

Name_____

Address_____

Free design for building 400-gal. spray unit with purchase of Power Package.

NITROGEN FERTILIZERS

(*Continued from page* 24)

monia, or ½ ton of ammonium nitrate.

Hardening and caking of nitrogen fertilizers is due mostly to the fact that these materials all have the ability to withdraw moisture from the air. In recent years many improvements have been made in manufacturing methods and improved containers which help overcome this.

Soil Reaction

Nitrate of soda applied to acid soils will exert a slight neutralizing effect and over a period of years this can be measured in terms of reduced lime requirement.

Sulfate of ammonia and ammonium nitrate have the opposite effect on the soil reaction. Their application will tend to lower the pH and make the soil more acid. Sulfate of ammonia is about three times as effective in lowering pH as is ammonium nitrate. In certain instances this is a definite advantage. Cultivated blueberries, which grow best under rather acid soil conditions, are usually fertilized with sulfate of ammonia because its continued use lowers the soil pH.

Most of the nitrogen absorbed by the roots of fruit crops is taken in as nitrate, but under certain conditions some ammonium is also taken up and utilized within the plant. At least a portion of the nitrogen supplied in the ammonia form, such as sulfate of ammonia, must first be converted by soil micro-organisms into nitrate. This process involves a slightly longer time interval between application and availability.

Of the three nitrogen sources discussed, sodium nitrate is the most quickly available since all of its nitrogen is in the nitrate form. Next in availability is ammonium nitrate with half of its nitrogen as nitrate and the remaining half as ammonia. Finally, all of the nitrogen from sulfate of ammonia is in the ammonia form and at least a part of this must undergo nitrification before it can be absorbed.

Under most conditions, this matter of rapidity of availability is not an important factor. However, in seasons when nitrogen application is delayed because of weather or other conditions until nearly bloom time, there is a real advantage in using a quickly available form such as nitrate of soda.

The conclusions of most investigators who have tested these three kinds of nitrogen fertilizers are that under normal conditions similar results will be obtained provided equal amounts of actual nitrogen are supplied. THE END.

"NOW, SAM, the big question with growers: 'What's *the* Fungicide for Apple Scab Control?"

From pre-pink to harvest, Stauffer Captan controls scab and other diseases, yet it's gentle to foliage and fruit.

For Scab. Spray with Captan 50-W. Prevents scab and gives dependable back-action.

For Scab and Powdery Mildew. Spray with Captan 50-W and sulfur from pre-pink through bloom.

For Scab, Powdery Mildew and Rust. Spray with Captan 50-W and sulfur, ferbam or zineb.

CAPTAN 50-W
with
Magnetic 70 Concentrated Sulfur Paste
For Scab and Powdery Mildew Control

Stauffer Mag "70," the cream of the sulfur pastes, is tops for use either alone or in combination with Captan, in the pre-pink through blossom sprays on apples. Stauffer Mag "70" sticks better! It is ground finer than the finest of the wettable sulfurs. Quick-setting and safe when used as recommended.

See your nearest Stauffer Dealer, now.

STAUFFER CHEMICAL COMPANY
380 Madison Avenue, New York 17, N. Y. • TAMPA • OMAHA • HOUSTON
San Francisco • Los Angeles • Weslaco • Lubbock • Harvey • No. Little Rock • No. Portland, Ore.

Stauffer CHEMICALS SINCE 1885

How "Skip" skips breakage

"We specify VISQUEEN polyethylene film because no other packaging material offers us so many advantages. Broken package complaints have been eliminated, housewives can't miss our trademarked packages and overall packaging costs are less because our lines operate at higher speed with less downtime. Every year, we buy hundreds of thousands of VISQUEEN bags from Acme Cellophane of Los Angeles."

"Skip" Tostado
Three J's Packing Co., Los Angeles, California

6 reasons why VISQUEEN T.M. film pays off

Strength of VISQUEEN eliminates breakage. Ink adhesion on VISQUEEN gives brighter printing. The uniformity of VISQUEEN means better machinability. Stiffness and body of VISQUEEN makes fabricating easier. The experience behind VISQUEEN assures superior quality. The all-over economy of VISQUEEN cuts packaging cost.

VisQueen® film is all polyethylene, but not all polyethylene is VISQUEEN. Only VISQUEEN has the benefit of research and resources of the **VISKING COMPANY** Division of Union Carbide and Carbon Corporation

PLASTICS DIVISION
World's largest producers of polyethylene sheeting and tubing
P.O. BOX AF3-1410 TERRE HAUTE, INDIANA
IN CANADA: VISKING LIMITED, LINDSAY, ONTARIO

ANHYDROUS AMMONIA

It's now the standard nitrogen fertilizer in Northwest orchards

By W. A. LUCE
County Agricultural Agent, Yakima, Wash.

ANHYDROUS and aqua ammonia have rapidly become standard nitrogen fertilizer materials for deciduous orchards in the Northwest. Both are cheap and easy to apply.

Anhydrous ammonia is a gas containing 83% nitrogen by weight. It can be injected directly into the soil or can be dissolved in the irrigation water. Ammonia gas dissolved in water becomes aqua ammonia, which also can be injected directly into the soil or dissolved in the irrigation water. When used as an injection, the aqua is generally marketed as a 20% nitrogen solution. Application of aqua ammonia is not suggested for sprinkler irrigation, since the possibility of loss by volatilization is too great.

All forms of ammonia move slowly in the soil until they are changed to a nitrate form. That is why they are valuable as materials for fall fertilization. The possibility of leaching is about nil.

The rate with which the ammonia nitrifies will depend on the soil temperature and the manner in which it is applied. The more widely the ammonia is dispersed in the soil, the faster it will nitrify. Banding heavily in a concentrated form will tend to delay the nitrification.

It would seem that the injection of anhydrous or aqua ammonia is especially adapted to orchards in a sod cover. Application of the material just under the cover keeps it away from the grass. Then the tree roots under a sod cover are generally close to the surface and can pick up the ammonia or nitrate quickly.

One application in the fall or early spring has been found satisfactory for nearly all fruit trees. THE END.

Injecting anhydrous ammonia gas in a Northwest orchard. Fertilizer dealers will do the job, or growers can rent equipment, do it themselves.

CLEANER FRUIT...

"EXCELLENT CONTROL"

"A commercial material containing 25 per cent of DDT and 3 per cent of parathion (Black Leaf 253) used at 2½ pounds to 100 gallons gave excellent control of the codling moth when used in all cover sprays and also controlled mites and Forbes scale." *

USE BLACK LEAF 253 COVER SPRAY

CONTROLS CODLING MOTH, RED-BANDED LEAF ROLLER, LEAF HOPPERS, EUROPEAN RED MITE, TWO-SPOTTED MITE, SAN JOSE SCALE, FORBES SCALE AND PESTS.

BLACK LEAF 253 available in 2½- and 5-pound bags, is a custom-tailored summer cover spray for maximum insect protection. Since it reduces the need for costly special sprays, it offers you an economical, uncomplicated spray program.

Apple growers, grape and pear growers, too—in major production areas like New York, Virginia, Pennsylvania and Maryland—have used Black Leaf 253 for their basic summer cover spray program for 3, 4 and 5 years. Each year, these experienced men return to this schedule because they simply can't find any material or combination of materials that give such a wide range of insect kill at such a low price.

Cleaner fruit 2 ways—greatly reduced visible residue and excellent pest control result in full colored, unblemished fruit.

LESS DDT RESIDUE . . . careful tests conclusively prove that less residue accumulates at harvest with Black Leaf 253 than with straight DDT. When used as directed, chemical analysis at harvest is well within the tolerance for these materials as determined by the Miller Bill.

COMPATIBILITY . . . Black Leaf 253 mixes readily with ferbam, captan, glyodin and aramite; also compatible with dieldrin, lead and DDD (rhothane or TDE).

HOW TO USE—Apples and pears . . . 2½ pounds of Black Leaf 253 in 100 gallons of water. Spray at 7- to 14-day intervals, until 21 days before harvest.

Grapes . . . use the same mixture and a regular three-spray schedule. Consult local recommendations.

IF YOU PREFER A MALATHION SPRAY . . .
that gets the same results as 253, is just as economical and just as easy to prepare—just add to water—ask for the 5-pound bag of
NEW BLACK LEAF 258

*Summary of Recent Developments in the Control of Insects and Mites Attacking Apples and Peaches, Transactions of Illinois State Horticultural Society, pages 99-102, by D. W. Hamilton, S. A. Summerland, H. J. McAlister, J. E. Fahey, U.S.D.A., Agr. Res. Adm., Bureau of Entomology and Plant Quarantine, Vincennes, Indiana.

Ask your dealer for Black Leaf 253, or write to:

Black Leaf

Diamond Black Leaf COMPANY
Cleveland 14, Ohio

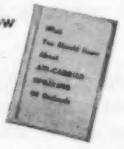
Model 26F
SPEED SPRAYER

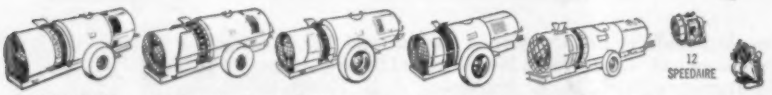
with a 1957 John BEAN Speed Sprayer

INCREASED CAPACITIES — For 1957, capacities have been increased in John Bean Speed Sprayers to assure you greater "rate of work" performance than ever before. This means greater speed and economy in doing the effective spraying job you need in your particular orchard. You get the deepest, most uniform penetration possible, using either concentrate or dilute applications. The exclusive John Bean air handling design permits you to gain all the advantages of high volume, low velocity air flow . . . controlled to fit your trees, under your specific spraying conditions.

A COMPLETE LINE — From the recognized leader of *all* orchard sprayers, the Model 40F Speed Sprayer, through the brand new Model 26F shown above, to the rugged Speedaire attachments, this 1957 John Bean line offers you the most complete selection in the field. You're sure to find a John Bean Orchard Sprayer suited exactly to *your* spraying requirements. See your John Bean Dealer now for a demonstration in your own grove or orchard.

"What You Should Know About AIR-CARRIER SPRAYING OF ORCHARDS" — Write today for your illustrated copy.





THE COMPLETE ORCHARD SPRAYER LINE

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

John BEAN LANSING 4, MICHIGAN
SAN JOSE, CALIFORNIA
Division of Food Machinery and Chemical Corporation

LIQUID FERTILIZERS

Michigan growers find that the liquids are great laborsavers

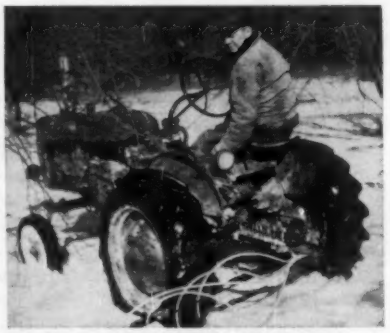
By R. C. VAN ANTWERP

MICHIGAN growers who have made fall applications of liquid fertilizers are well-pleased with the results.

Glen Meachum, of Hartford, applied 7 pounds of 3-9-9 liquid fertilizer (Haviland Agricultural Chemical Co., 421 Ann St., N.W., Grand Rapids, Mich.) per tree on 20 acres of orchard. The job took five hours, with one man and a tractor-equipped distributor. To accomplish the same job with dry fertilizers required the full day's work of four men with a tractor and trailer.

Bela E. Kennedy, of Bangor, made comparative applications of liquid nitrogen (Uran) and ammonium nitrate at 3 pounds each per tree on 35 acres of apple orchard.

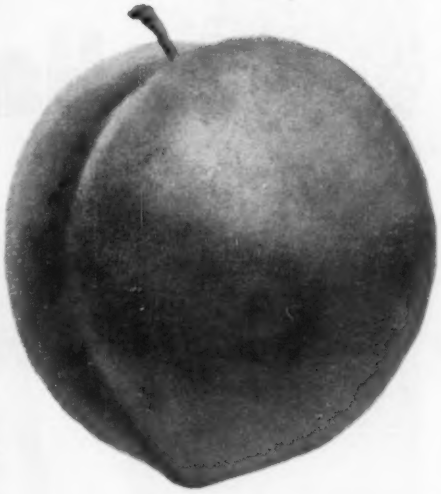
Since the same amount of nitrogen was applied to each tree, there was no difference in tree appearance or in fruit set. The outstanding difference was in the time and labor required by the two methods. To fertilize the same number of acres required 3½ hours with the liquid and 52 hours with the dry material.



Applying liquid fertilizer in orchard of Bela Kennedy, Bangor, Mich. The liquid is sprinkled or dribbled over the soil from boom on Krause Liquid Fertilizer Applicator (The Krause Corp., Hutchinson, Kans.) costing from $175 to $200 with parts. Liquid is delivered by tank truck and stored on farm in storage tank or drums. It is then poured into applicator drum, which meters it onto ground at a predetermined rate.

Liquid fertilizers are not "solid fertilizers" dissolved in water. They are produced by reacting liquid materials, such as ammonia and phosphoric acid, to produce various ratios of nutrients. Additions to this liquid base of dry or liquid materials (such as dry urea, liquid nitrogen solutions, dry potassium chloride, liquid caustic potash, etc.) may be made to further vary the analysis. THE END.

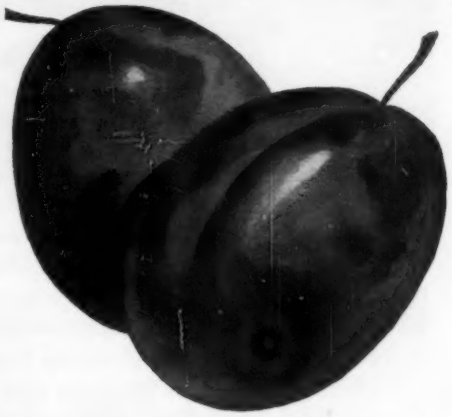
Harvest bigger yields, better quality fruit!



STOP

Plum Curculio

WITH dieldrin

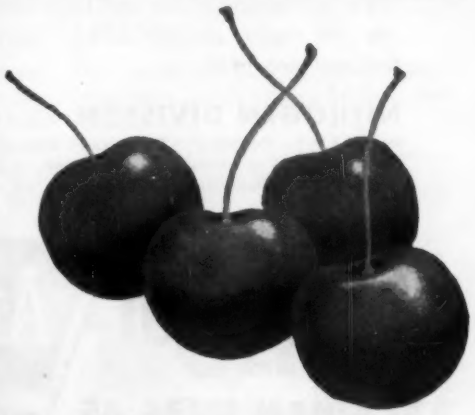


One serious infestation of plum curculio can destroy your fruit profits. That is why more and more growers are safeguarding their crops with powerful dieldrin.

Dieldrin's long-lasting action keeps on controlling plum curculio for many days after application. And it puts an end to these pests if they touch, taste, or breathe it. Dieldrin is the answer to more effective plum curculio control.

Apply dieldrin spray during the pre-bloom or post-bloom periods. For most effective use of dieldrin in your area, check the recommendations of state authorities.

Get bigger yields of better quality fruit this season—control plum curculio and "catfacing" insects with dieldrin. Dieldrin is available under well-known brand names from your insecticide dealer.



SHELL CHEMICAL CORPORATION

Agricultural Chemical Sales Division
460 Park Avenue, New York 22, New York

Shoot for Heavy Harvests!

There's more profit for you in every bag of ARCADIAN UREA 45, the concentrated 45% nitrogen fertilizer. You need this quick, effective nitrogen grow-power to make your trees and vines shoot out the strong, vigorous, green growth that builds big yields. UREA 45 is all high-quality Urea nitrogen, fast-dissolving, leach-resistant and quick-acting even in cold soils. You get 36 pounds of actual nitrogen in every 80-pound bag, to feed your crops faster and easier. ARCADIAN UREA 45 spreads easily through any equipment, and dissolves readily in irrigation water. It's a real money maker and labor saver, any way you use it. See your dealer—get ARCADIAN UREA 45 now to grow finer fruit and more of it!

NITROGEN DIVISION Allied Chemical & Dye Corporation

New York 6, N. Y. • Hopewell, Va. • Ironton, Ohio • Omaha 7, Neb. • Atlanta 3, Ga.
Columbia 1, S. C. • Kalamazoo, Mich. • Indianapolis 20, Ind. • Columbia, Mo.
Raleigh, N. C. • St. Paul 4, Minn. • San Francisco 4, Cal. • Los Angeles 5, Cal.

NITROGEN DIVISION ALLIED CHEMICAL

Grow with Arcadian

ARCADIAN UREA 45 the concentrated, free-flowing nitrogen

Broadcasting Cyanamid during late November at Ore Hill Orchards, Roaring Spring, Pa.

HE LIKES CYANAMID!

Pennsylvania grower applies cyanamid in the late fall

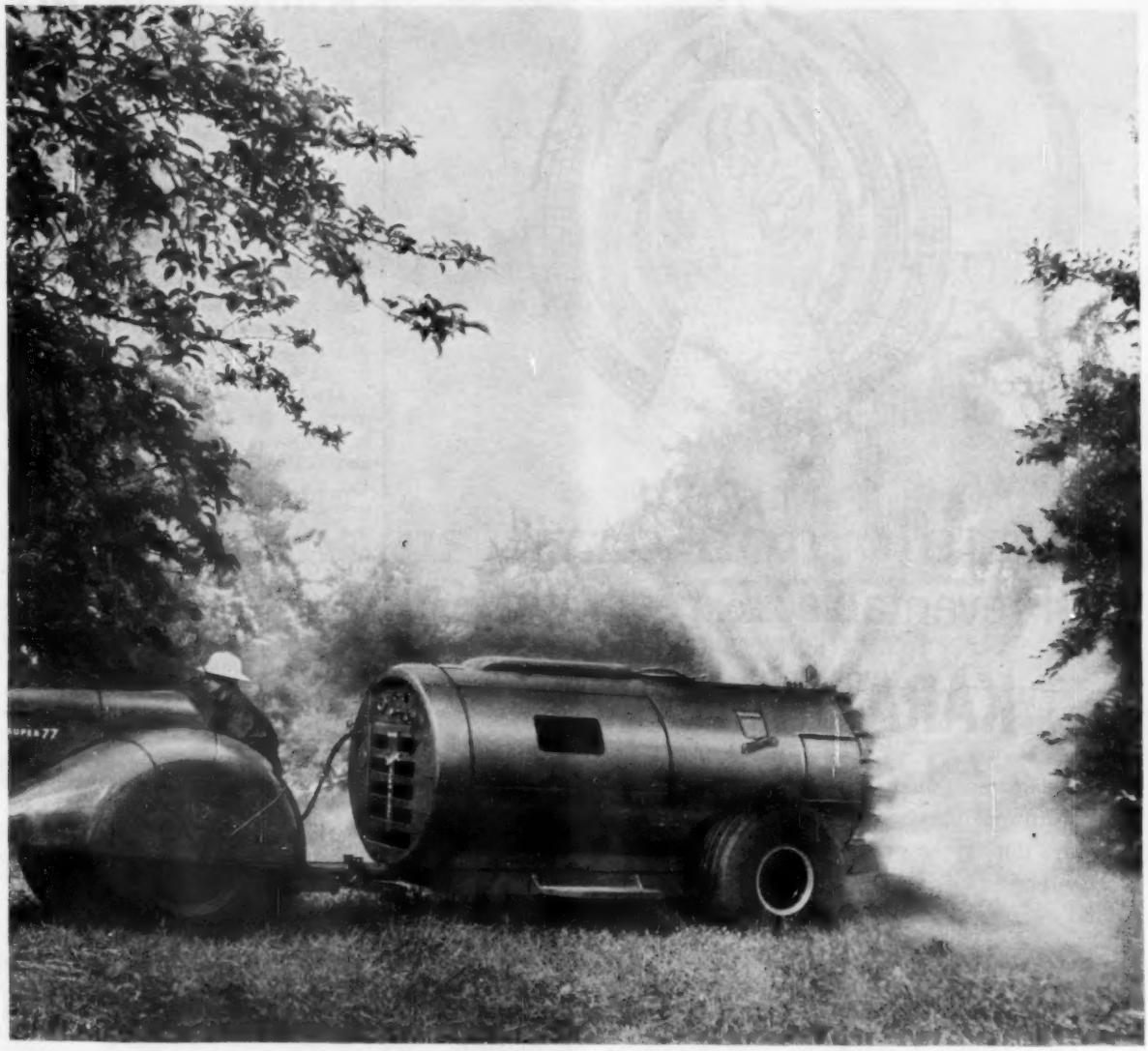
IN a one-time iron-mining area at Roaring Spring, south of Altoona, Pa., Charles Packard grows 400 acres of apples and peaches. Ore Hill Orchards boasts a 60,000-bushel refrigerated storage, and the fertilizer program is aimed at producing a top-quality crop to fill that storage.

Packard relies largely on AERO Cyanamid for fertilizing his trees, which are under a sod cover. Applied in the late fall, during the dormant season, it gives his trees a steady, long-lasting supply of nitrogen that results in the magnificent quality and excellent color for which his fruit is known. Over 20 tons of Cyanamid are used on his apple and peach orchards each year.

Apple trees over 20 years old get 5 pounds of Cyanamid per tree; 10- to 20-year-old trees get 3 pounds; younger trees get proportionately less. No material is applied to 3-year-old or younger stock.

In the spring he applies a complete fertilizer, 10-10-10, to round out his program. Trees over 20 years old get 12 pounds per tree, 10- to 20-year-old trees get 6 pounds, while 3-year-old trees get 3 pounds. THE END.

Transporting bags of Cyanamid to orchard.



New! Oliver Spra-Blast has both diesel power plus positive spray control

Now's the time to capitalize on Oliver's big two-way orchard savings—diesel power *plus* high-speed Spra-Blast coverage.

Oliver diesel savings snowball—from first cost to final maintenance. The original cost is *low*—no higher than similar gasoline-powered competitive sprayers. Fuel savings are *big*—often as much as two-thirds your normal gasoline cost, depending on local fuel prices. Maintenance costs are very low, due to Oliver's long life and everyday dependability.

You get unmatched time-savings, too, for this Oliver is built for really high-speed spraying. It's short, low and handy in the orchard...stable on the sidehills. It has 500-gallon capacity which saves refilling time ...easy-to-reach controls.

And in addition, you get all of Oliver's famous Iron Age quality features: big-capacity centrifugal pump for dilute sprays or an Iron Age high-pressure pump for concentrates...corrosion-resistant tank... new, big-capacity axial-flow fan... sliding doors that permit one-side spraying...full-vision instrument panel.

See your Oliver dealer for a money-saving Model 500.

The OLIVER Corporation
400 West Madison Street
Chicago 6, Illinois

OLIVER

"FINEST IN FARM MACHINERY"

Mildewed terminal

Mildew mycelium

Cross section of infected bud

Preventable?...Yes, with

KARATHANE WD

The damage caused by powdery mildew on apple terminals is illustrated above. Had this orchard received KARATHANE sprays during the previous season this infection could have been prevented. It would not have had a chance to develop and overwinter on the dormant tissues. When infected buds break in the spring the mildew fungus spreads to young leaves, blossoms and twigs. In orchards with a history of powdery mildew, protection with KARATHANE should begin in early spring—*to prevent the spread of infection.* In orchards without a record of powdery mildew infections the treatment with KARATHANE should begin as soon as mildew appears. In KARATHANE you have an effective mildew fungicide. When correctly applied, it is harmless to foliage, blossoms and fruit. In addition, KARATHANE will help keep mite populations under control. Ask your dealer for more information on KARATHANE. It is recommended by many Agricultural Experiment stations.

Powdery mildew fungi are difficult to wet. To improve wettability by KARATHANE sprays add TRITON B-1956 spreader-sticker.

KARATHANE *and* TRITON *are trade-marks, Reg. U. S. Pat. Off. and in principal foreign countries.*

Chemicals for Agriculture

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

Know Your pH

A soil test will tell you if your pH is correct

By EARL F. DOWNEY

ONE ton of fertilizer intelligently applied can produce much more effective fertilization than 10 tons used indiscriminately. This is why we depend upon systematic soil testing, to tell us the degree of acidity or pH in our soils.

Most of the beneficial nutrient elements in fertilizer become locked up in soil with a pH below 5.5 (acid) and above pH 7 (alkaline). When the soil pH is brought within the proper growing range of the crop, the fertilizer nutrients become more readily available.

As an example: When the soil pH range is from 4.5 to 6., very little phosphoric acid is available. Just as soon as this pH range is changed to run from 6. to 7., by the use of lime in some form, the phosphoric acid is unlocked and plant roots are able to take up the nutrient.

Agricultural chemists have made available soil-testing equipment that even unskilled persons can use to advantage. I have used many different kits. One of them is Sudbury.

These kits will tell you your soil pH. They also help you determine the amount of plant nutrients to add to the soil to bring it to a high state of productivity. The amount is given in percentages. This is the right system, to my way of thinking. Even though you could determine the quantity of any element in the soil, how would you know if it were enough or too little? The kits tell you just how much of what to add.

6.5—A Happy Medium

Boron is much more readily absorbed by a crop growing in a soil with a pH to 6. to 6.5 than it is at pH 7.

Nitrogen is more readily available between pH 6. and 7. than anywhere else on the pH scale. This indicates that high-nitrogen fertilizers will not be as effective when applied to soil outside this range in pH.

Potash becomes less and less available to crops as the pH drops below 6. For root crops, especially, potash is very essential, so be sure your soil pH is corrected to run from 6. to 7.

The only sure way to correct the acid or alkaline condition of your soil so that your crop will derive the maximum benefits from fertilizers is to make soil tests. THE END.

PULL OUT . . . KEEP FOR HANDY REFERENCE

This is your
1957 MALATHION GROWER'S GUIDE

...the basis for a complete insect control program all through the season

Here's exactly what malathion's combination of *high* toxicity to insects and *low* toxicity to man can do for you. . .

You kill more insects
Malathion is an aphicide *and* miticide *and* general insecticide for fruits, vegetables, forage crops and flies. It kills 82 pests on 47 crops, lets you cut the number of insecticides you buy and handle. This guide shows how malathion *alone* is a complete program for many crops.

You get safety-in-use
Though a phosphate, *low* toxicity to man and animals makes malathion "one of the safest insecticides to handle" (USDA). Precautions for safe handling are similar to those required for DDT. Malathion is compatible with most fungicides, liquid fertilizers, insecticides.

You can control insects close to harvest—
Federal law has established tolerances on insecticide residues at harvest. Malathion's low toxicity to man and animals has given it a relatively high tolerance. Its rapidly disappearing residues will be well below this limit when applied *as close as 72 hours (3 days) from harvest* of many crops. You get thorough, late-season cleanup of insects without residue problems!

You can control DDT-resistant pests
You can control insect strains resistant to DDT and other chlorinated hydrocarbons . . . for example, grape leafhopper, codling moth, and flies resistant to DDT . . . red-banded leaf roller resistant to DDD.

CYANAMID

pull up—keep for handy reference

1957 MALATHION

FRUITS

Thorough, full-coverage applications should be made.

pests	amount: Emulsifiable Liquid Per 100 gals.	amount: Lbs. Wettable Powder 25% Per 100 gals.	amount: Lbs. Dust Per Acre	Number of Applications	Days Before Harvest for Last Application
Apples					
Woolly apple aphid Bud moth	1 pt.	2	—	1+	3
Green apple aphid Rosy apple aphid	1½ pts.	2 2½	—	1+	3
Mealybug	1-2 pts.	2½	—	1+	3
Mites such as: European red mite Clover mite *Willamette mite *Two-spotted mite	1-2 pts.	2-2½	—	2+	3
*Make at least two applications 10-12 days apart in summer months					
Codling moth Plum curculio Red-banded leaf roller	2 pts.	3	—	1+	3
Forbes scale	1 pt.	2½	—	2-3	3
These pests are also controlled by combining 1½ pts. Emulsifiable Liquid or 2 lbs. Wettable Powder and 2½ lbs. 50% Methoxychlor WP or 2 lbs. 50% DDT, WP. Malathion Emulsifiable Liquid may cause injury to McIntosh and Cortland varieties in summer sprays.					With DDT 30 Methoxychlor 14
Pears					
Mites	1-2 pts.	2-2½	—	2+	3
Pear psylla	1-2 pts.	2-2½	—	1+	3
Mealybug	1-2 pts.	2½	—	1+	3
Codling moth Plum curculio Fruit tree leaf roller Red-banded leaf roller	2 pts.	3	—	1+	3
The same combination treatment suggested for apples can be used for pears. Injury may occur to Bosc pears under certain conditions in the Northeast using malathion sprays.					With DDT 30 Methoxychlor 14
Peaches					
Mites such as: European red mite Two-spotted mite	—	2-2½	—	2+	7
Oriental fruit moth Plum curculio	2 pts.	3	—	2+	7
San Jose scale	California only—Prepare a tank mix of 3 pounds 25% Wettable Powder plus 2 gallons of oil emulsion plus 4 pounds of fixed copper per 100 gallons of water. Apply only when trees are dormant.				
The same combination treatment suggested for apples can be used for peaches.					With DDT 30 Methoxychlor 14
Apricots					
Codling moth Orange tortrix European Lecanium scale Soft brown scale Aphids	1½-2 pts.	4	—	1+	7
Avocados					
Latania scale Greenhouse thrips Omnivorous looper Orange tortrix Soft brown scale	1½ pts.	3	—	1+	7

pests	amount: Emulsifiable Liquid Per 100 gals.	amount: Lbs. Wettable Powder 25% Per 100 gals.	amount: Lbs. Dust Per Acre	Number of Applications	Days Before Harvest for Last Application
Cherries					
Black cherry aphid	—	2	—	1+	3
Black cherry aphid and Fruit tree leaf roller	1½ pts.	—	—	1+	3
Injury may occur on certain varieties of sweet cherries particularly in the Northwest.					
Cranberries					
Leafhoppers Black-headed fireworms	1½ pts.	2½	50 by airplane 30-40 by ground machine 4 or 5%	1+	3
Spittlebug nymphs Cranberry fruitworm	1½ pts.	2½	—	1+	3
Grapes					
Leafhopper	1½ pts.	1-1½	20-40 lbs.	1+	3
Spider mites	1½ pts.	—	4% + Sulfur	2+	3
Mealybugs	1½ pts. (50-100 gals.)	—	—	1+	3
Injury may occur on Ribier grapes with Emulsifiable Liquid.					
Dates					
Nitidulid beetles Apply thoroughly to each cluster.	—	—	4 or 5%	1+	7
Pineapple					
Mealybug	1 pt.	2	100 4 or 5%	1+	7
Plums & Prunes					
Mealy plum aphid	1 pt.	1	—	1+	3
San Jose scale Prunes only	California only—Prepare a tank mix of 3 pounds 25% Wettable Powder plus 2 gallons of oil emulsion per 100 gallons of water. Apply only when trees are dormant.				
Plum curculio and Mealy plum aphid	See combination below	—	—	—	
These pests can be controlled by combining 1-1½ pts. Emulsifiable Liquid or 2 lbs. Wettable Powder and 2½ lbs. 50% Methoxychlor WP or 2 lbs. 50% DDT, WP.					With DDT 30 Methoxychlor 14
Strawberries					
Aphids Spider mites	1½ pts.	2½	40 4 or 5%	1+	3
Blueberries					
Cranberry fruit worm	—	2	—	4+	3
Cherry fruit worm	—	4	—	4+	3
Blueberry maggot	—	—	25 4%	4+	3

Ornamentals Poultry

Malathion sprays and dusts stop practically *all* insects attacking ornamentals. Malathion 4% dust stops chicken red mite, northern fowl mite. Dust, or sprinkle on floor, nests, roosts. Do not apply directly to birds. Avoid contamination of water, feed.

MALATHION Grower's Guide

pull up – keep for handy reference

VEGETABLES

Thorough, full-coverage applications should be made.

pests	amount: Emulsifiable Liquid Per 100 gals.	amount: Lbs. Wettable Powder 25% Per 100 gals.	amount: Lbs. Dust Per Acre	Number of Applications	Days Before Harvest for Last Application
Tomatoes					
Spider mites	1½ pts.	2	35-45 4 or 5%	1+	3
Aphids	1 pt.	2		1+	3
Tomato russet mite	—	2-4		1+	3
Peas					
Pea aphid	1½ pts.	—	25 4 or 5%	1+	3
Beans					
Mexican bean beetle	1½ pts.	—	30-35 4 or 5%	2+	3
Leafhopper	—	—	30-35 4%	2+	3
Spider mites	1-1½ pts.	—	—	2+	3
Broccoli • Cabbage • Kale Turnip • Mustard					
Aphids	1-2 pts.	2	30 4 or 5%	1+	3
Imported cabbage worm					7
Cabbage looper					
Brussels Sprouts					
Aphids	1-2 pts.	2	30 4 or 5%	1+	7
Cauliflower					
Aphids	—	—	50 4%	1+	7
Peppers					
Aphids	1 pt.	2	—	1+	3
Eggplant					
Aphids	1 pt.	2	—	1+	3
Spider mites					
Lace bug	3 pts.	—	—	1+	3
Beets					
Aphids	1½-2 pts.	—	—	1+	7
Potatoes					
Aphids	1 pt.	2½	25-30 5%	1+	3
Leafhopper					
Onions					
Thrips	1½ pts.	4	30-40 4 or 5%	1+	3
Spinach					
Aphids	2 pts.	—	30-35 4%	1+	7

pests	amount: Emulsifiable Liquid Per 100 gals.	amount: Lbs. Wettable Powder 25% Per 100 gals.	amount: Lbs. Dust Per Acre	Number of Applications	Days Before Harvest for Last Application
Cucumbers • Squash • Melons					
Aphids	1½ pts.	—	30-35 4 or 5%	1+	3
Spider mites					
Leafhopper on melon	—	—	30-35 4 or 5%	1+	3
Do not apply malathion to cucurbits unless plants are dry.					
Lettuce					
Aphids	2 pts.	2	30-40 4%	1+	7
Mites	—	—	30-40 4%	1+	7
Cabbage looper	—	—	30-40 4%	1+	7
Leafhoppers	2 pts.	—	—	1+	7
Celery					
Aphids	1½ pts.	—	—	1+	7
Spider mites					

CITRUS

Grapefruit • Lemons • Limes • Oranges Tangerines • Tangelos • Kumquats

California red scale Yellow scale Purple scale Black scale (single brooded) Soft scale Citricola scale	1-1½ pts.	2½-3½ *(this dose also controls off-brooded black scale)*	—	1+	7
Florida red and purple scales (light and medium infestations)	2 pts.	3—light 3-5—medium	—	1+	7
Thrips Dosage per acre	2½ pts. per 200 gals.	6	—	1+	7
Green citrus aphid	—	1-2	—	1+	7
Mediterranean Fruit Fly	—	2-3 lbs.* per acre	—	1+	3

Make no applications when trees are in bloom. For further information on use of malathion, either alone or in combination with petroleum oil, parathion or other materials, see local agricultural authorities.

*Add 1 lb. of Yeast Hydrolysate or 1 qt. sauce base #2. Use sufficient water for good coverage by ground or air equipment. Malathion may be toxic to certain species of fish, particularly in shallow water.

FIELD

Alfalfa					
Aphids Potato leafhopper Spider mites Alfalfa weevil larvae Spittlebug	1½-2 pts	—	30 4 or 5%	1+	7*
Vetch bruchid	—	—	30 4 or 5%	1+	7*
Grasshoppers	1½-2 pts.	—	—	1+	7*

Do not apply to alfalfa in bloom. *No application within 7 days of harvest or pasturing.

Clover					
Aphids Mites	1½-2 pts.	—	25-35 4 or 5%	1+	7*
Young grasshoppers Leafhoppers	1½-2 pts.	—	—	1+	7*

Do not apply to clover in bloom. *No application within 7 days of harvest or pasturing.

pull up—keep for handy reference

1957 MALATHION Growers' Guide

FLIES

FOR USE IN AND AROUND BUILDINGS WHICH HOUSE DOMESTIC ANIMALS, AROUND YARDS, AROUND HOMES, AND AROUND MEAT PROCESSING ESTABLISHMENTS

STRAIGHT MALATHION SPRAYS			FOR BAIT SPRAYS (WITH SUGAR)	
			Add to Mixture	
Amount Spray	Amount Emulsifiable Liquid	Amount 25% Wettable Powder	Sugar	or Molasses* or Corn Syrup
2½ gals.	1 cup	1 lb.	1 cup	1 cup
12 gals.	1 qt.	5 lbs.	2½ lbs.	1 qt.
100 gals.	2 gals.	40 lbs.	20 lbs.	2 gals.

*Use unsulfurized molasses

Apply the spray at the rate of one gallon per 1,000 square feet on painted surfaces and two gallons per 1,000 square feet on unpainted surfaces where flies alight or congregate. Use 3 gallons of malathion Emulsifiable Liquid or 40 lbs. of 25% Wettable Powder with 40 lbs. of sugar per 100 gallons if fly population is severe. In most cases, adding molasses or sugar to the spray prolongs the insecticidal activity of malathion and serves as a fly attractant. Do not use in milk rooms. Avoid contamination of feed and food products. Remove animals and poultry from buildings before treating. Do not use in dwellings. Do not leave within reach of children. Do not use in rooms where edible products are handled.

You get all these advantages with malathion

LOW TOXICITY—Malathion is high in toxicity to insects but low in toxicity to mammals. The precautions to be followed for its safe handling are similar to those required for DDT. These instructions will be found on every package of malathion insecticides.

COMPATIBILITY—When mixed in the spray tank, malathion is compatible with aldrin, DDT, lead arsenate, methoxychlor, mineral oil, parathion, TDE, dieldrin, ferbam, glyodin, captan, chlordane, karathane, tribasic copper sulfate, sulfur, toxaphene, zineb, ziram, other organic phosphates. When alkaline insecticides and fungicides are added to the spray tank with malathion formulations, the residual activity of the malathion may be decreased.

HIGH RESIDUE TOLERANCE—Under the "Miller Bill" (Public Law 518) malathion has been granted a residue tolerance of 8 parts per million. This means that 8 p.p.m. or less by weight of actual malathion can be present in or on crops for which a tolerance has been established. Malathion residues disappear rapidly. That's why the longest waiting period between last application and harvest is 7 days . . . and for many major fruit and vegetable crops the waiting period is only 72 hours.

CYANAMID

PROTECTION FOR FRUIT FINISH—Many fine finish programs specify malathion because it offers a wide margin of safety to fruit and foliage of sensitive varieties.

FORMULATIONS — American Cyanamid produces and sells only technical malathion. Many well-known manufacturers use this technical material to make and sell, under their own brand names, emulsifiable liquids containing four or five pounds of malathion per gallon; wettable powders containing 25% malathion; and dusts of 4% and 5% malathion.

WANT MORE COPIES of this Grower's Guide? Write to address below.

AMERICAN CYANAMID COMPANY,
NITROGEN AND ALLIED PRODUCTS DIVISION, DEPT. N
30 ROCKEFELLER PLAZA, N. Y. 20, N. Y.

IS LIME IMPORTANT?

Connecticut growers say yes; increase lime use sixfold

MORE and more information is accumulating to show the need and desirability of balanced nutrition for fruit trees. In Connecticut, dolomitic limestone is playing a major role in improving nutritional levels of orchard soils.

There are several reasons for the increased use of dolomitic limestone with its high calcium and magnesium content. A 1936 survey showed strongly acid conditions prevailed in many Connecticut orchards.

As late as 1953, leaf analysis tests showed that in 74% of the samples, trees were deficient in calcium and 45% were low in magnesium. By 1956, however, only 65% were low in calcium and 17% in magnesium. There were definite indications of improvement in soil pH. Incidentally, potash applications are also being increased. Leaf tests in 1953 showed 25% low in potash with only 7% low in 1956.

Meanwhile distributors of lime report a sixfold increase in amounts of lime applied to Connecticut orchards in the past five years.

Soil test records show that the pH average of better-managed Connecticut orchard soils has moved from pH 5.0 to pH 6.0 in the past 20 years. Connecticut in this same period of time has been producing approximately the same crop, but on one-third less acreage. Many improved practices, including liming, are contributing to better, quality yields.

Improved lime-spreading equipment, magnesium and potassium leaf deficiency symptoms in some orchards, new techniques for analyzing soil and leaf deficiencies, conservation payments, and a necessity for growing more high quality apples per acre are all contributing to increased lime applications.—*A. C. Bobb, University of Connecticut.*

New England Lime Company

Improved bulk lime equipment such as this spreader makes application easy and quick.

STOP

THE LEAF-SPOT PLAGUE

Actispray*

SOLUBLE ANTIBIOTIC TABLETS

effective leaf-spot eradicant before during and after harvest

Actispray, the new antibiotic fungicide, effectively controls leaf-spot disease in both sweet and sour cherries. Since it may be applied up to 4 days before harvest, its protective action lasts through the harvesting period.

ACTISPRAY—

Acts rapidly Actispray kills the established fungus within one hour after spraying.

Kills the established leaf-spot infection By actual test Actispray is one of the most effective leaf-spot eradicants. This eradicative action provides for long term protection.

Keeps trees healthy Once Actispray removes the burden of the leaf-spot fungus, the tree becomes more vigorous and should be able to form more fruit of higher quality. Studies show that Actispray-treated cherries are firmer and less susceptible to brown rot.

Easy to use Simply drop the easily dissolved tablets into the spray tank with agitator running, then spray.

Economical Just one tablet added to 100 gallons of water makes enough 1 ppm solution to treat 25 trees. Every drop of the solution is active.

Does not stain . . . leaves no visible residue Actispray is also recommended for non-bearing trees, nursery stock, and transplanted trees one to two years old.

Actispray antibiotic tablets are supplied in convenient glass tubes, 24 tablets to a package.

*TRADEMARK, REG. U.S. PAT. OFF.

Upjohn

Actispray is a product of

THE UPJOHN COMPANY, CHEMICAL SALES DIVISION, KALAMAZOO, MICHIGAN

HERE'S REAL VALUE

in Orchard and Specialty Power

However you measure it, the thrifty, low-cost Model B is the "buy of the year" for orchard and specialty-crop farming.

POWER? The Model B delivers full 2-plow power to handle the most demanding jobs in your operation. Battery ignition system assures steady engine power at all speeds.

CONVENIENCE? The Model B — long known for easy handling — now offers the added timesaving convenience of SNAP-COUPLER hitch. The new 2-bottom plow, 2-row bedder, 2-row drill planter, and field cultivators are all mounted tools, attached minute-quick with SNAP-COUPLER hitch.

VERSATILITY? The Model B can be equipped with just the right tool for any job. In addition to your orchard work, it has dozens of other uses — harvesting grain and seed, mowing and raking, hauling and choring jobs.

ECONOMY? You can own the Model B for a price you can't match anywhere. Low operating cost and long life . . . along with its many timesaving features . . . make the Model B an unsurpassed tractor value.

Own a new Model B tractor — and pocket the savings. See your Allis-Chalmers dealer . . . soon!

ALLIS-CHALMERS, FARM EQUIPMENT DIVISION, MILWAUKEE 1, WISCONSIN

SNAP-COUPLER is an Allis-Chalmers trademark.

Model B with new 2-bottom plow. Hydraulically lifted and lowered. SNAP-COUPLER hitch.

ALLIS-CHALMERS A-C

BUILD UP YOUR SOIL

Grow your own organic matter with the help of fertilizers

By RICHARD BRADFIELD

Cornell University

MOST fruit growers recognize the importance of maintaining a good supply of organic matter in the soil. Among the advantages are: 1) Soils high in organic matter are in better tilth and are easier to work; 2) they are more permeable to water and are better aerated; 3) they usually contain more nitrogen and phosphorus than soil low in organic matter; and 4) the nitrogen and phosphorus in organic matter do not leach during the winter and are released gradually by micro-organisms as soon as the soil warms up and plant growth starts. The rate of release of nutrients stored in soil organic matter tends to be synchronized closely with the needs of the growing crop.

Is Organic Farming Feasible?

Growers differ as to how this organic matter, which they all admit is so important, should be supplied. One rather small but highly vocal group believe in the use of organic fertilizers only. They attribute many virtues to organic fertilizers and many faults to chemical fertilizers which have not been supported by careful scientific experiments.

For example, they claim that crops which are grown with organic fertilizers *only* are more nutritious, less subject to attack by diseases or insects, and preferred by animals to the same crops grown with chemical fertilizers. They believe that all organic waste should be carefully preserved and processed through a compost pile.

Most people holding these views are city people who have had little experience with practical farm problems. The compost pile is a very useful way for the backyard gardener to convert the leaves and grass clippings from his lawn, the crop residues from his garden, and certain types of kitchen waste into a good fertilizer.

Growers with more extensive acreage, however, will find a compost pile inadequate for their needs. In addition, organic fertilizers are bulky and costly to transport.

Grow Your Own Fertilizer

The feasible way for most growers to maintain organic matter in their

(*Continued on page* 42)

quality goes up— costs come down with . . .

• This McIntosh tree in the Davis Orchard, Bolton, Mass., has been protected from both scab and rust for 15 years with Du Pont "Fermate." Long-term tests prove that "Fermate" performance helps increase yields of fancy apples . . . at lowest cost to you.

Du Pont Fermate®

FERBAM FUNGICIDE

HERE ARE 5 WAYS YOU PROFIT

1. **Wide-range protection:** "Fermate" controls both scab and rust, plus more minor diseases than any other fungicide.
2. **Maintain orchard vigor:** "Fermate" helps keep leaves dark green. Good foliage makes big yields.
3. **Low original cost:** The low price of "Fermate" means less money in the tank.
4. **Lower cost per bushel:** More apples with "Fermate" means lower cost of production.
5. **Fine finish of red varieties:** "Fermate" does not contribute to sun scald or russet of red varieties.

FOR PEACH-LEAF CURL . . . Both experiment stations and growers have found "Fermate" a highly effective, yet inexpensive, dormant spray.

. . . and for the most effective answer to other fruit-growing problems, use these dependable Du Pont chemicals

To control both scab and rusts on all apple varieties including Goldens, use Du Pont Thylate® thiram fungicide. Tops for early control, for combining with mercury curatives or sulfur, and for a buffer spray. Its white residue allows fine finish on all varieties.

Don't let sooty blotch or flyspeck take over an otherwise clean crop. Regardless of the early protection used, put Du Pont Parzate® zineb fungicide in late-season sprays and be sure. It's light-colored and leaves no residue.

Kill both curculio and codling moth with Du Pont Marlate® 50 methoxychlor insecticide. The long-lasting residue protects from one spray to the next. Marlate® doesn't contribute to russeting—even on sensitive varieties.

DU PONT
REG. U. S. PAT. OFF.

On all chemicals, follow label instructions and warnings carefully.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Curculio and Codling Moth

kill BOTH apple pests with ONE insecticide

Du Pont Marlate® 50

Methoxychlor Insecticide

Apples get double protection from one insecticide when you spray "Marlate" 50. It stops curculio damage—early or late. And, when cool weather delays emergence, "Marlate" 50 controls late curculio as well as codling moth that may be active at the same time. The long-lasting residue from "Marlate" holds against curculio and codling moth from one spray to the next.

Finer finish and more effective protection close to harvest are other extras you get with "Marlate." Du Pont "Marlate" doesn't contribute to russeting—even on sensitive varieties. Use it to stop apple maggot, right up to 7 days before picking.

CHERRY GROWERS

"Marlate" 50 gives you top control of curculio and cherry fruit fly plus mild action on fruit and foliage. Put a block on a "Marlate" 50 program and see for yourself. On Montmorency, "Marlate" 50 helps increase yield by assuring better vegetative growth. Use it on English morello to avoid dry stem.

GRAPE GROWERS

Spray with Du Pont "Marlate" 50 methoxychlor insecticide for effective control of grape berry moth . . . right up to seven days before harvest without residues being a hazard to consumers. Experiment stations now recommend "Marlate" 50 for particular use in late season sprays. Du Pont "Marlate" 50 is also the dependable insecticide to use for control of Japanese beetle and grape leaf skeletonizer.

On all chemicals always follow label instructions and warnings carefully.

DU PONT
REG. U.S. PAT. OFF.

MARLATE® 50
Methoxychlor Insecticide

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

BUILD UP SOIL

(*Continued from page* 40)

soils is to grow it themselves, in the form of green manure crops. If a leguminous crop is grown and if it is liberally fertilized with chemical fertilizers, a larger yield of a crop which is higher in nitrogen content usually results. If a non-leguminous crop such as rye or rye grass is grown and well fertilized it too will yield more and will contain more nitrogen which will make it a more valuable green manure crop when plowed under.

One of the best ways to reduce production costs is to increase yields per acre. To get high yields per acre crops must be well fertilized.

Farmers cannot depend on organic fertilizers alone, because there simply is not enough material available to meet their needs. They must depend on growing the amount of organic matter needed to keep their soils in good tilth by the liberal use of chemical fertilizers. Countries which do not use chemical fertilizers almost invariably have a very backward agriculture. THE END.

ARE YOUR APPLES GETTING BORON?

LACK of available boron in the soil may cause a reduction in growth and yield of apple trees, says James M. Beattie, of Ohio Agricultural Experiment Station.

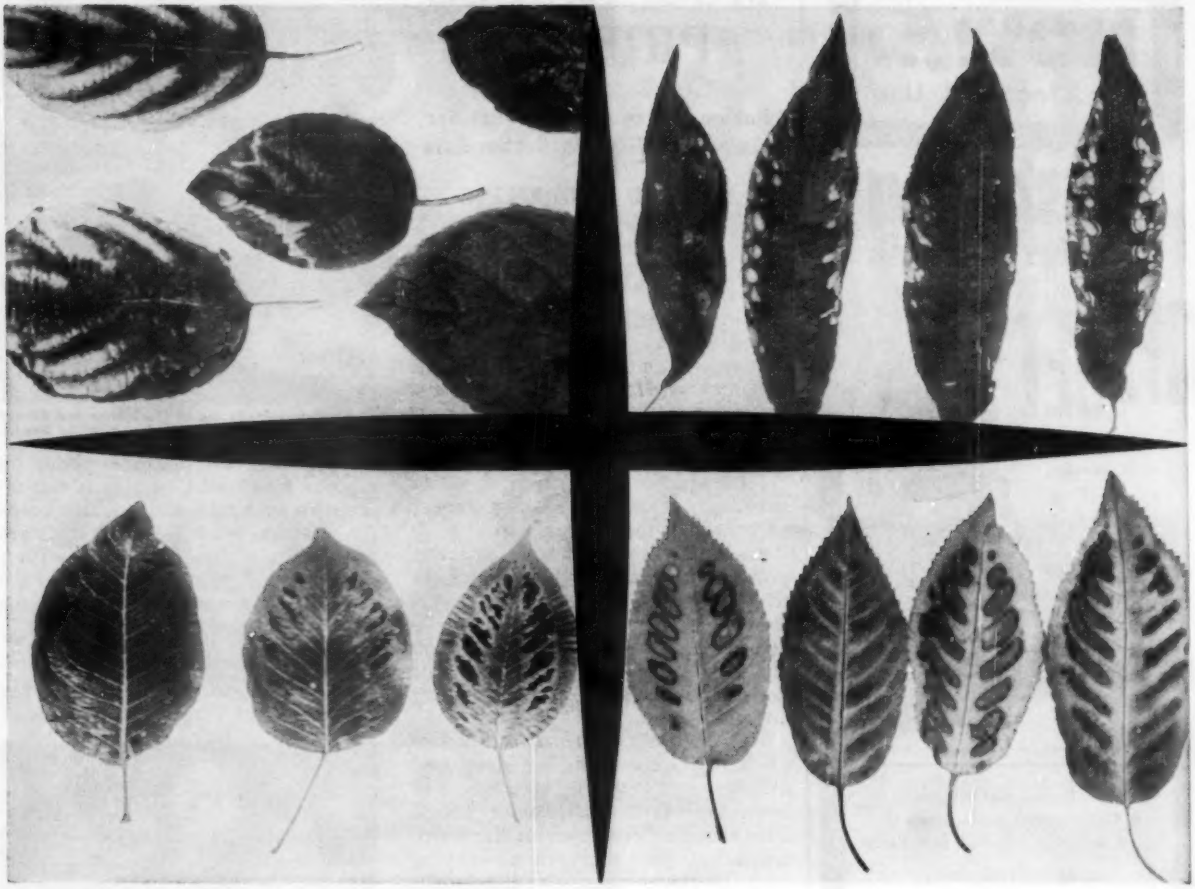
Beattie points out that tests show a deficiency may exist even though there are no visual symptoms of a need for boron. Foliar analysis is the best method for telling when boron is deficient.

PROPAGATION HANDBOOK

What amounts to a handbook on fruit tree propagation has been issued by the New York State Experiment Station, Geneva, and is available upon request to the station. Prepared by Karl D. Brase, pomologist, the bulletin covers the subject from the handling of seed for rootstock production to budding and grafting, and goes into detail on propagation practices followed in the northeastern United States.

He advises growers to look for these symptoms of boron deficiency: Dieback of terminal shoots and smaller branches, yellowing of the leaf followed by death of leaf tips, and external and internal "cork" symptoms of the fruit itself.

When a boron deficiency is known to exist, growers should apply borax at the rate of ¾ pound per mature bearing tree every third year. Beattie states, however, that at some point before visual symptoms occur, a boron deficiency may have already affected tree growth and yields.



have you seen any of these in your orchards?

Apples | Peaches
Pears | Cherries

Chances are—you have *not*, because the dead spots in these discolored leaves appear only in the later—and very obvious—stages of magnesium deficiencies. When you do see these magnesium deficiency danger signs in the leaves, you'll probably also see other indications of a very serious shortage of magnesium: (1) early defoliation; (2) poor fruit color; (3) lower fruit quality; and (4) winter damage of trees.

Don't wait until early defoliation, inferior fruit and winter kill tell you your trees lack the water-soluble magnesium they need. Then, it's too late. Profit-wise fruit growers prevent magnesium deficiencies *before* they become obvious . . . before the shortage of water-soluble magnesium robs them of maximum yields and top profits . . . by applying recommended amounts of SPM Premium type fertilizer containing Sul-Po-Mag. An investment of just pennies per tree can guarantee that your trees will get *both* fast-acting, readily available, water-soluble magnesium . . . and sulphate of potash. Most fertilizer manufacturers make grades with "SPM." Ask for them at your fertilizer dealer.

S·P·M PREMIUM

Premium quality fertilizer certified through use of a balanced combination of the water-soluble magnesium and potash obtained from Sul·Po·Mag

Look for this identifying SPM Seal of Approval when you buy. It's your assurance of extra-value fertilizer.

SPM Premium-type fertilizers guarantee **Sul·Po·Mag**®

Water-Soluble Double Sulphate of Potash-Magnesia
($K_2SO_4 \cdot 2MgSO_4$) 22% K_2O—18% MgO

potash division

INTERNATIONAL MINERALS & CHEMICAL CORPORATION
20 NORTH WACKER DRIVE · CHICAGO, ILLINOIS

NOW... for Orchard Use

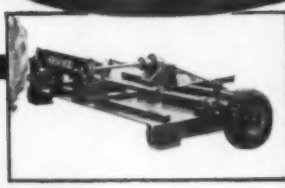
Bush-Hog

ROTARY CUTTERS

New

OFFSET

MODEL
(7 ft. swath)



- Mulches Prunings where they fall!
- Eliminates Brush disposal problems!
- Saves Time, Saves Labor, Saves Money!

The new BUSH HOG Offset model permits easy tree circling. Cuts and mulches brush and prunings in one easy, quick operation. Turns waste cuttings into soil improving litter which helps retain moisture around trees. Works fast and efficiently — reduces labor needed at pruning time — saves money in labor and fertilizer costs.

Includes famous BUSH HOG features—one piece arc-welded wrap-around steel frame which retains all litter until completely mulched ... famous "free-swinging blades" hold position by centrifugal force and fold back to strike again at hard to cut objects.

Easily converts to conventional cutter — by removing offset belt drive. BUSH HOG cutter can be connected to direct power drive shaft for pasture mowing, brush disposal and land cleaning jobs.

SEND COUPON

For full details and name of your nearest BUSH HOG Dealer

BUSH HOG MANUFACTURING COMPANY
Selma, Alabama

Dept. 3

Name.....

Address.....

City..... State.....

MECHANIZED PRUNING

Pneumatic pruning is best for them, say Virginia orchardists

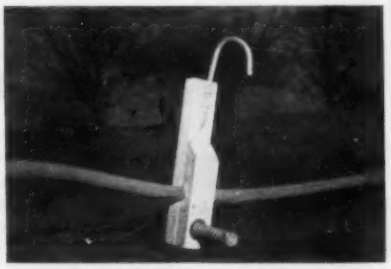
By FRED R. DREILING
Virginia Polytechnic Institute

IT is eight years now since pneumatic pruning came into its own in Virginia. It has become well established and continues to grow as the best way to get the pruning job done.

Experience has shown that savings in labor ranging from 25 to 50% are possible. Morris Crumpacker, of Crumpacker Orchards, Roanoke, says, "Our expenses for pruning peaches have been cut in half through the use of power pruning equipment."

In mechanizing their pruning, growers have shown a preference for the power take-off mounted compressor unit. Several growers have developed a sliding clutch arrangement on their engine-drive compressor units. This has given quicker starting on cold mornings.

Purcell McCue, Jr., of Appledore Orchard, Greenwood, has developed a lightweight hose line attachment to hook over limbs and ladder rungs. This relieves the worker of the entire weight of the hose while working with the power tools. The attachment is under spring tension, but slides along the hose.



Hose line attachment used to hook over limbs and ladder rungs where power tools are used.

Many growers who are using power pruning tools have cited improvement in their pruning. In their opinion the trees are being opened up better from the outside. This is particularly true where portable platforms are used.

Pruning Platforms

It has been found by growers, however, that platforms should be built to fit the particular orchards in which they are to be used.

A platform developed by grower Joe Dorsey, of the Moore and Dorsey operation, Berryville, incorporates a leveling device for sloping orchards.

Pruning platform in use at the Moore and Dorsey Orchard, in Berryville, Va., has leveling device.

Each side of the platform pivots on a heavy iron rod. One side is run up or down by a turn screw which keeps the platform level. Once the trees are opened up, a three-man crew with a platform and power tools can do the work of four men pruning from the ground with the same tools.

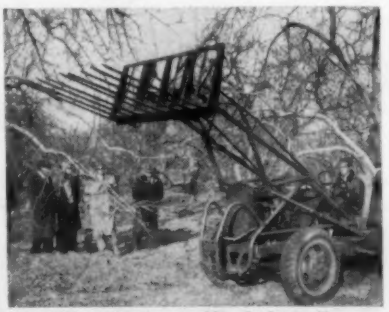
Brush Removal

The rotary brush shredder is being widely used in Virginia as a means of

The rotary brush shredder is being widely used in Virginia to dispose of orchard brush.

disposing of orchard prunings. Joe Dorsey states, "One man can cut up 50 acres of brush in less than a day with the rotary brush shredder." His big problem is to keep enough brush windrowed ahead of the shredder.

Some growers prefer to remove the prunings from the orchard and burn them. Where this practice is followed the brush pusher is used. J. T. Henley of Crozet, pushes out 20 acres of brush in a day's time. THE END.



Clay Hill orchard near Mt. Jackson, Va., use this pusher to remove prunings from the orchard.

STOP FIRE BLIGHT AND WALNUT BLIGHT WITH NEW ®AGRI-MYCIN* DUST

*Patent Pending

New! Dust Formulation containing antibiotics Terramycin® and streptomycin in an economical easy-to-use application.

Most effective control yet discovered for Fire Blight of pears and apples and Walnut Blight.

Gives long-lasting disease control without russeting of fruit. Boosts yields and market quality.

Four years of tests on more than 100 thousand apple, pear and walnut trees have shown that Agri-mycin spray powder is the most effective control for Fire and Walnut Blight yet discovered.

Now—for the first time—this proven control is available to West Coast growers in a new economic *dust* formulation.

Fights Blight Two Ways, Doubly Effective

Agri-mycin Dust slowly releases the disease-fighting antibiotics which are then absorbed directly into the leaves and blossoms of your trees—fights blight *within* the plant tissues as well as protecting the outside surface.

It's doubly effective—contains not only streptomycin but the wide-range antibiotic Terramycin as well. Terramycin retards development of streptomycin-resistant strains of bacteria and actually increases the effectiveness of the streptomycin.

Here are the results you get from Agri-mycin Dust:

- Gets outbreaks of Fire Blight of pears and apples and Walnut Blight under control fast.
- Prevents spread of blight diseases.
- Gives prolonged immunity to re-infection.
- Does not cause russeting of fruit.
- Boosts yields, market quality.
- Non-injurious to foliage.

Follow Your Standard Dusting Practices

Agri-mycin Dust can be combined with fungicides for simultaneous application when needed. It can be used with your regular commercial dusting equipment.

AGRI-MYCIN DUST

Completely formulated and ready to use is now available from these leading West Coast formulators:

L. H. BUTCHER & CO.
Los Angeles, Calif.

PACIFIC GUANO CORP.
Berkeley, Calif.

SUNLAND INDUSTRIES INC.
Fresno, Calif.

UNITED CHEMICAL CO.
Richmond, Calif

For growers who prefer sprays, Agri-mycin 100 Spray Powder is also available in concentrate form for use as an aqueous blossom spray.

Chas. Pfizer & Co., Inc.

Pfizer

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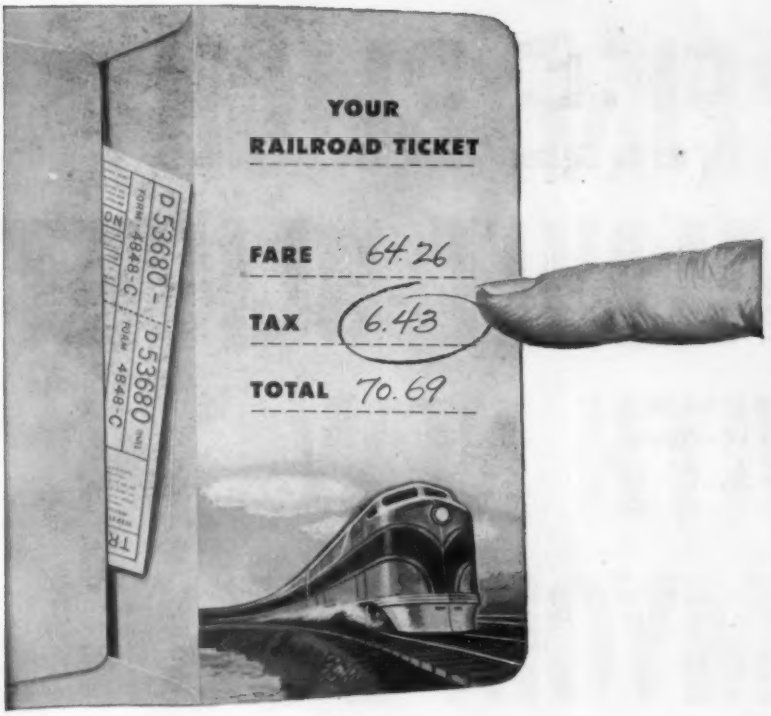
World's largest producer of antibiotics

® TERRAMYCIN BRAND OF OXYTETRACYCLINE



You still pay these "temporary" wartime taxes

During World War II, Congress levied special taxes on the passenger fares and freight charges paid to railroads and other forms of public for-hire transportation. One reason for these special taxes was to discourage the use of these transportation facilities in wartime.

The war ended more than ten years ago but these taxes go on – and on. They still add an extra 10 per cent to the passenger fares you pay, and they add 3 per cent to the freight charges on everything that moves by public carriers such as railroads.

The reason for these "temporary" wartime taxes vanished long ago. But they are still discouraging the use of our public transportation systems. And by so doing, these taxes are weakening our public carriers—essential to peacetime commerce and vital to national defense.

These discriminatory and burdensome taxes should be repealed – *now!*

ASSOCIATION OF
AMERICAN RAILROADS
WASHINGTON, D. C.

LEAF ANALYSIS

(*Continued from page* 13)

What fertilizer elements will leaf analysis provide information about?

In Michigan, the samples are analyzed for 10 essential nutrient elements and the results placed on a nutrient element balance chart. The balance charts show the grower what is needed. A letter giving specific fertilizer suggestions is sent with the chart.

Can leaf analysis be used on peaches and cherries as well as apples?

In Michigan, all tree fruit crops, including apples, peaches, pears, cherries, plums, and prunes are covered. Plans are to include all fruit crops by 1960. Blueberries and grapes will be included soon. Raspberries and strawberries need much research to establish standard values before they can be included.

What states have leaf analysis service and how can I go about getting this type of help?

New York, Maine, Connecticut, and Delaware have such a service. Leaf analysis is also being used in California and Florida for citrus and tung. Ohio, Pennsylvania, North Carolina, and New Jersey have spectrographic facilities and are doing a lot of leaf analysis. It would be a good idea to get in touch with your state extension fruit specialist and ask him for his advice on how to proceed to have a leaf analysis made. A commercial firm which will make a leaf analysis for you is the National Spectrographic Laboratories, 6300 Euclid Ave., Cleveland, Ohio. Other spectographic laboratories are becoming interested in leaf analysis. Interpretation of the results is not usually done by commercial laboratories.

Do I take leaf samples or will someone come in to do this?

The leaf analysis service in Michigan is organized so that leaf samples are collected by extension agents and growers. The grower selects the location to be sampled and supplies information concerning previous fertilizer applications, soil management practices, tree condition, and spray program.

What is the cost?

The actual cost to analyze a leaf sample for 10 elements is approximately $15.00. This cost can be lowered somewhat by the use of

(*Continued on page* 65)

SPRAY FASTER FOR LESS

BUFFALO TURBINE *Turbulent Air*

The "Stainless Streamliner" SPRAYER

Model "H"

The Modern Concentrate Sprayer for ALL

Orchards, Groves and Row Crops

The ONLY Air-Blast Sprayer With EVERYTHING

WHAT IT DOES . . .

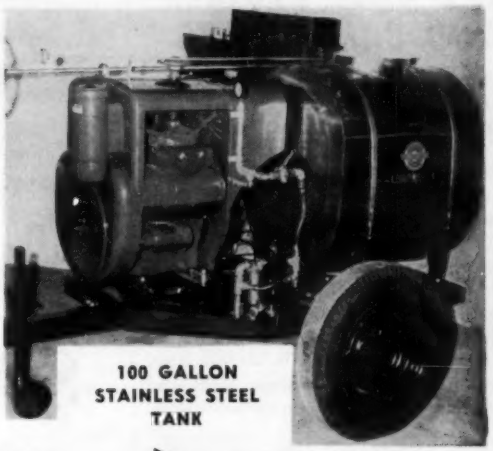
Uses turbulent air to atomize and apply concentrated sprays and/or dust, giving a thorough and wide-ranged coverage never before possible . . . . providing a means of quick and thorough application. Is adjustable to give desired degree of agitation to foliage, with enough velocity to completely carry through the tops of trees as well as through row after row of heavy thick leaf cover in row crops.

For Those Who Only SPRAY

200 GALLON STAINLESS STEEL TANK

SPRAYER-DUSTER

Model-C5



100 GALLON STAINLESS STEEL TANK

For Those Who DUST and SPRAY

CHOICE OF PUMPS

6 to 30 Gal. Per Minute

HOW IT DOES IT . . .

By using turbulent air as the vehicle, you can distribute insecticides and fungicides in the form of a liquid or dust or a combination of both in any proportion. The use of a combination of dust and "liquid sticker" has never been successfully done before, primarily because the sticker was used as the carrying medium, whereas Buffalo Turbine Sprayer-Dusters use air as the vehicle.

You can vary this blast of air in jet formation from a gentle breeze to a hurricane of 180 MPH. This is why you can get such an extremely long "carry" and also accurate directional control and extreme penetration.

COMPARE!!

With the Rest

THEN BUY!

The Best

- LOW INITIAL COST
- LOW MAINTENANCE COST
- LESS MATERIAL COST
- GUARANTEED SERVICE
- STAINLESS STEEL TANK
- LIGHT IN WEIGHT
- ONE MAN OPERATION
- FASTER COVERAGE
- TWO-WAY ADJUSTABLE AXLE
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Write For Literature or FREE Demonstration

Some Territories Open

Dealer Inquiries Invited

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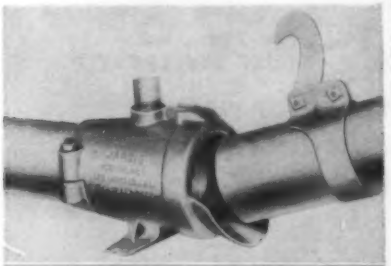
BUFFALO TURBINE

Buffalo Turbine Agriculture Equipment Co. Inc.

Gowanda, New York

THE ONLY SYSTEM YOU CAN AFFORD

Maximum benefits of sprinkler irrigation come to only those who buy the very finest. Anything less means frequent replacement expense, high operating cost, extra labor and waste. You make it permanent when you buy Hardie Rain Control Portable Sprinkler Irrigation equipment. It pays for itself. You have money to buy additional equipment instead of replacements. Hardie Coupler is the strongest ever built. You get exclusive design and high precision manufacturing in every detail in Hardie Rain Control Coupler and Valves. Sold and serviced by strong, responsible dealers.



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- Entire coupler made of S-356T6 High Strength aluminum alloy. It is the strongest coupler by any test.
- A 2-bolt clamp is cast integral with coupler. Easily and quickly attached without pipe damage.
- Both semi-permanent, and quick detachable automatic coupling is provided by two slots for steel hook on pipe.
- Sturdy foot is slotted for bolt or screw.
- The very finest interior finish on coupler and valves assures the minimum of flow resistance.
- Design features eliminate surging.

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The HIGH QUALITY Line

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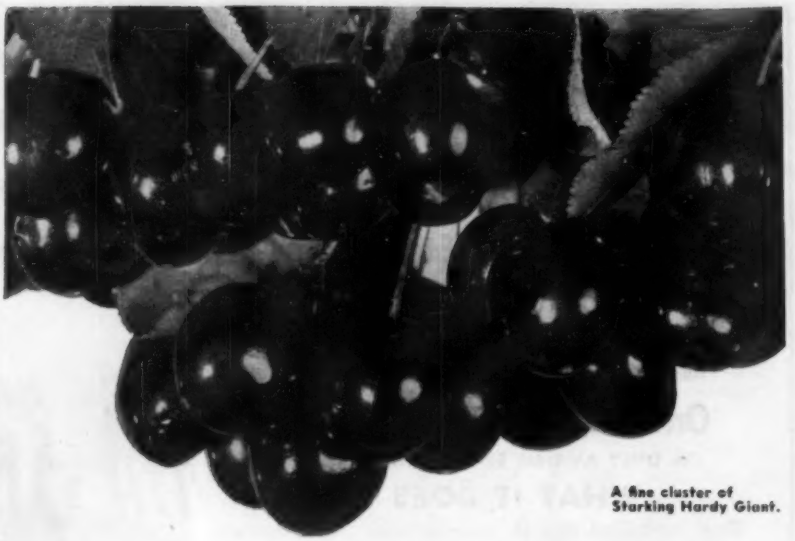

A fine cluster of Starking Hardy Giant.

Make Profits with

SWEET CHERRIES

Getting into the sweet cherry business is easier and quicker than it was a few years ago

By PAUL STARK, JR.

IT IS now possible to profitably produce better sweet cherries, especially in some areas that have not been able to grow this luxury-priced fruit in the past.

Sweet cherries fit well into a diversified orchard plan and do not interfere much with other fruits. There are good possibilities of growing a limited acreage of sweet cherries near industrial centers with a U-Pick-Em plan. Sweet cherries also have profit value in extending the season with a roadside market by attracting customers well ahead of the peach and apple season.

New varieties, such as Starking Hardy Giant and Van, make vigorous and highly productive trees that come into bearing at an early age. These varieties went through the disastrous Northwest freeze last winter when so many others were wrecked beyond repair. The cherries are large and of excellent quality, and firm enough to be shipped and handled just like the popular Bings. They are both highly resistant to rain cracking.

The new varieties are good pollinators for such present standard varieties as Bing, Lambert, and Napoleon. Schmidt's is also a fine cherry for the Midwest and East but is slow in coming into production. Gold has exceptional hardiness, is a good pollinator and highly productive, and is well adapted to the briner processing trade. It is also fine for the local market.

Starting young cherry trees successfully has been a problem in the past but now 100% stands can be expected if growers use strong one-year-old trees that are virus-free. Careful storage to keep trees dormant and moist is important, and shipping containers should be lined with polyethelene paper to insure the arrival at the orchard in perfect planting condition.

How to Plant

Cherry trees can be planted like any other fruit tree, but the holes should be a little larger so as to accommodate the stiff root systems that won't bend. Just as soon as the trees are set and holes are three-fourths refilled, pour in 2 to 3 gallons of water to which the recommended amount of soluble fertilizer has been added. After this has soaked in and the dirt has settled around the roots, carefully fill the holes, leaving the bud union, or offset at the trunk base, just above the ground after the soil has settled.

An important step is to protect the trunks of the trees up to the lower branches with paper, cardboard, screen, or preferably aluminum-

PAUL STARK, JR., is vice-president of Stark Bro's Nurseries & Orchards Co., Louisiana, Mo.

coated building paper. This product is available at most lumber yards, is cheap in price, and readily forms into a cylinder about the tree trunks. Two string ties hold it in place. Freezer grade aluminum foil also can be used, but it must not be placed tight around the trunk. It should be formed into a cylinder so air can circulate around the trunk area. This protection should be left on the trunks for several years until the lower branches have developed sufficiently to shade the southwest side.

Pruning should be done right after planting. Sweet cherries should be low-headed to prevent sunscald and help keep the trees down in height. Whips should be headed at no more than 24 inches and the leader on branched stock should not be over 30 inches at its tip, with others headed to 8 to 10 inches from the trunk.

Start the first season to train for a strong framework with three or four well-spaced branches with wide angles. Selecting some of the frame-

(*Continued on page* 51)

Don't plant sweet cherry too deep. When hole is full, bud union should be above ground. Too deep planting has been known to cause injury.

Be sure to firm the dirt around the roots as hole is filled by tamping with heel of foot.

When hole is ¾ full, add 2 to 3 gallons water with right amount of soluble fertilizer.

ONE OR BOTH SIDES

WEED AND BRUSH CONTROL

SPRAY FARM ANIMALS

CLEANING EQUIPMENT

WHITEWASHING

FIRE PROTECTION

Now you can spray apples, peaches, cherries with a big volume high velocity air stream—35,000 cfm . . . Use either concentrate or dilute spray . . . Enjoy absolute pest control at lowest cost per acre . . . Do other spraying jobs done best by air stream . . . And the higher price you get for quality fruit pays for the sprayer . . . You can spot spray with a hand gun . . . Knock grubs out of cattle with a high pressure stream, 20 gpm at 400 psi or 50 gpm at 80 psi . . . Spray bushes, shrubs, gardens, weeds, brush . . . Apply insecticides, liquid fertilizer, disinfectants . . . Flush animal stalls, pens . . . Whitewash buildings, fences . . . Clean tractors, trucks, autos . . . Put out fires.

You can do all this with one sprayer—the 2-fan Hardie Duo-Fan Model 24B, designed, built and priced to give the grower both air stream and high pressure spraying in one compact, streamlined, Hardie quality unit. It's two sprayers for the price of one. Write for literature. Ask your dealer.

OVER 80,000 CUBIC FEET OF AIR PER MINUTE

If you have a big acreage pest control job in orchard or grove, you need the magnificent new Hardie Duo-Fan Model DF-40, delivering more than 80,000 cubic feet of air per minute—the largest air stream sprayer ever built, and the most modern. Another model, the Hardie Duo-Fan Sprayer Model 26B, is especially designed for average fruit acreage. Delivers air at 45,000 cfm. Hardie also builds High Pressure Sprayers for orchard and row crop spraying in a wide range of sizes and styles.

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PEST CONTROL EQUIPMENT
portable sprinkler irrigation systems
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This Respirator Protects Against 8 Toxic Sprays

THE M-S-A FARM SPRAY RESPIRATOR

Here's the one Respirator that makes outdoor spray programs safer. New type filters keep users on the safe side of toxic sprays. Replaceable with in-use M-S-A Farm Spray Respirators. Accepted by U. S. Government Interdepartmental Committee on Pest Control. Write for details.

M-S-A GMC-1 INDUSTRIAL GAS MASK—For heavier mixing concentrations of all the above organic insecticides. "All-Vision" facepiece gives full facial protection—maximum vision.

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The gentle, uniform water distribution pattern of Skinner sprinklers has never been excelled—is your best assurance of maximum growth and health—bigger and better yields—healthier trees—and effective frost protection. It will pay you to specify Skinner sprinklers on your portable irrigation system.

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WINDFALLS

It is said that Isaac Newton while sitting under an apple tree was struck on the head by a falling apple. Thus he conceived the great truth of his Law of Gravitation.

By HENRY BAILEY STEVENS

Self Service Two Ways THE very interesting discussion of "picking your own" proceeds. Eurena Graver Beers, of Palmerton, Pa., wins the prize this month for her report of the experience of a Self-Service Cherry Orchard operated over the years at Parryville, Pa., by Charles Markley. A postal-card announcement such as the following starts the trek:

"We have an abundant crop of cherries this year (1956) and picking will begin about July 12 and continue until the supply is exhausted. Come and bring your friends and neighbors. Trees are low, and most picking can be done from the ground; however, we will furnish stepladders if needed. Prices are 20 cents per quart or 10 cents per pound if you pick them; 30 cents per quart if you desire them picked."

Markley decided on the Montmorency variety after disappointment with the poor production of the English Morello. He planted 250 in 1922 and today has 2000. In 1927 he took a load to market, and, unable to sell them, had to watch them turn brown in a packing house. He became disgusted and resolved that if anyone wanted cherries thereafter they could pick them. This was the beginning of his help-yourself merchandising.

Some customers pick as many as 200 pounds for their own use. Nearby churches have learned to can or freeze a good supply for winter bake sales and cherry crumb pies. The card states whether the crop is small or plentiful.

At the orchard the customer is told where the biggest and ripest cherries can be found. Containers are weighed in and registration taken for the mailing list. There is no supervision. Because of the late crop last year, radio announcement was also made. Signs advertising the orchard are placed at strategic spots along highways. The Markleys have a drum of water and paper toweling at a convenient place so that no one need leave with "sticky hands."

The advantages of this system outweigh the disadvantages," says Markley. "Customers usually go home with more cherries than they planned to take. Harvesting and marketing costs are less. There is little waste, as most trees are picked clean with few cherries left for late-comers or birds. On the other hand, it is true that the crop is a perishable one. It cannot be held over for any length of time, and a prolonged rainy spell at harvest could mean a heavy loss. So far the weather has been on our side. "I'd never want to go back to harvesting the old way."

The Question in Reverse THERE are two sides to this coin; and we have been hearing from the "heads" that carry the motto "In God we trust." My old colleague Ted Kangas of New York speaks up for the eagle on the reverse side that sits guarding the currency: "How about the experiences of growers who have managed to *prevent* the public from coming in to pick their own? I am thinking of some of my friends in the Hudson Valley, where fast-growing suburban and urban home developments have begun to encircle their orchards. Many other growers must have the same problem with people who climb the fence and pick the choice fruit without paying, much less saying 'by your leave'".

Now that's a fair question. Let's hear some of the tails.

Address your "Windfalls" contributions to Henry Bailey Stevens, AMERICAN FRUIT GROWER, Willoughby, Ohio.

SWEET CHERRIES

(*Continued from page* 49)

work branches can be done early in the first season. Unwanted shoots can be pinched back or removed, enabling the remaining permanent branches to make a faster and better framework structure.

A medium-sized, open-center tree hastens production and gives much better distribution of the fruits under conditions in the East and Midwest. The central leader at three to six years of age may have to be removed or headed to a lateral to make an open center. When this is done, be sure to leave enough spurs or suckers

Protect trunk with aluminum-coated building paper. Note how branches were headed back.

Heading back upward growing branches to outward growing laterals keeps trees down in height and open-spreading, making picking easier.

on the remaining framework branches to prevent sunscald. Constant cutting to strong outward growing lateral branches will help to widen and open the trees.

One of the keys to successful eastern and midwestern production of sweet cherries is an adequate spray program with captan to prevent leaf spot defoliation and control brown rot, along with a mild insecticide program. Maintaining healthy foliage all season is imperative, to build up resistance to winter injury and promote early bearing.

Young sweet cherry trees can be managed either with strip cultivation and intercrops or in sod with straw or rotted alfalfa mulch. Nitrogen fertilizers are important in the spring, but summer applications are to be avoided. THE END.

Build Yield-Power equal to more acres

SWIFT'S PLANT FOODS BRING MORE CASH INCOME PER ACRE

Build your income by building the Yield-Power of your soil—make each acre produce extra dollars. It's more profitable than planting more acres in high-value crops.

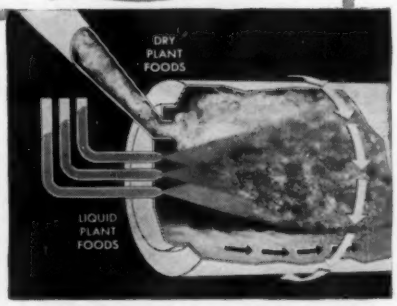
Use Swift's Specialized Crop Makers—**Vigoro Commercial Grower, Blenn** or **Brimm**—if you want the absolute peak in yield and quality. They contain extra growth elements especially needed by fruits and vegetables for top quality as well as yield. **Red Steer,** too, is the choice of thousands of leading market growers.

Swift's plant foods are made by the exclusive new FLO-FUSION process which packs each particle with fertility—assures balanced feeding of your crop. They are made in plants located in your area, so they can be tailored to local soil and crop needs.

The high market value of your crop—quality as well as yield—demands special care. This year build Yield-Power equal to more acres of good land—use the latest and best plant foods.

Swift's new FLO-FUSION process packs each particle of plant food with supercharged Yield-Power

High-quality liquid plant foods are injected into dry materials in a revolving FLO-FUSION processing chamber at Swift's Plants. Millions of individual chemical reactions convert raw materials into chemically-hitched plant food, drying the particles as they are formed. You get the benefit of this FLO-FUSION process only at Swift Plants throughout the nation.



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The Sprinkler of Achievement

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Trailerload of ammonium nitrate ready to be applied to individual trees in this Ohio apple orchard at rate of ¼ pounds per year of tree's growth. Regardless of age, trees rarely get more than 6 pounds ammonium nitrate per year. Orchard is in permamnent bluegrass sod. Every third or fourth year orchard gets broadcast treatment of 500 pounds per acre of 10-10-10 fertilizer in place of the nitrogen application. This helps the cover crop and supplies some potassium to the trees. *Left*—Henry Heisy (looking up) supervises harvest of highly-colored apples in his Greencastle, Pa., orchard. To get lots of red color he keeps nitrogen applications light, using about 2 pounds nitrate of soda per mature tree.

Fertilizing APPLE TREES

Here are points to consider in planning a fertilizer program for your orchard

By ELDON S. BANTA

NITROGEN, the backbone of apple orchard fertilization, has been the subject of much study. In Ohio tests, its application in early spring (by April 1) has given best results. Other states confirm this practice.

Nitrogen has tremendous effect upon fruit set and flower formation. High nitrogen content in the tree at blossom and postblossom time insures a good set of fruit, whereas very low nitrogen content results in dropping of flowers and undeveloped fruit.

During the summer months when flower buds for the following year's crop are forming, the tree must not possess excessive amounts of nitrogen. If it does, too vigorous growth is promoted, carbohydrates are not stored, and few flowers are developed. A moderate or even low, but not deficient, nitrogen content is thus desirable during most of the growing season.

Again emphasis must be placed upon the danger of overnitrating an orchard at the expense of other fertilizer elements, especially potassium and magnesium.

With many variables to keep in mind, your orchard fertilization pro-

Cover crops such as soybeans planted alongside young trees in this H. F. Byrd orchard, Charles Town, W. Va., help reduce amounts of chemical fertilizer needed, especially nitrogen, potash.

Apple trees, especially young ones, if given too much nitrogen, grow too vigorously and set few flowers. An overdose of nitrogen made for long, willowy twig growth on this tree.

Frequent inspection of his trees helps Jerry Hull, Canfield, Ohio, plan a good fertilizer program. Large, dark-green leaves on moderately vigorous twigs shows balanced fertility.

gram this year will depend upon whether:

1) Your orchard soil has good structure for deep root penetration and for good drainage.

2) Your orchard is in sod, cover crops, or clean cultivation.

3) Your orchard soil is naturally well-stocked with minerals.

4) Your orchard is mulched.

5) Your varieties require heavy or light fertilizer applications, especially of nitrogen and potassium.

6) Your pruning practices are heavy or light.

7) Your trees have plenty of available water or can be irrigated.

8) Your trees carried a heavy or light fruit crop last year.

When you fit all these factors together with the results of soil and leaf analyses in an economical fertilizer program, then you are on the road to becoming a good orchard manager. THE END.

Tiling to aid water drainage helps make fertilizer elements more available to tree roots in Ernest Downing orchard, New Madison, Ohio.

"For the last eight years I have used Puratized Agricultural Spray on a preventative schedule basis, with no injury or reduction in yield. As a matter of fact, yields of the better grades have increased about 20%."

"I have been growing Macintosh apples for 25 years and for the last four years have used Puratized Agricultural Spray by applying it within 48 hours after every rain. The quality of apples has improved considerably since I have used Puratized and yields have been excellent."

"I've been using Puratized since it was first introduced in the Hudson Valley in 1948. In all this time we have kept scab out of all of our orchards except once when we didn't add enough to our tank. As for me I'll stick to Puratized."

"I like Puratized Spray. It doesn't freeze, it's easy to handle and mix. I've used it in combinations with other fungicides for five years and my yields have improved, and so has the apple finish. Some of these other fungicides are probably all right if you use them at the right time, but I play it safe and use Puratized."

Here's what four growers have to say about Puratized Agricultural Spray

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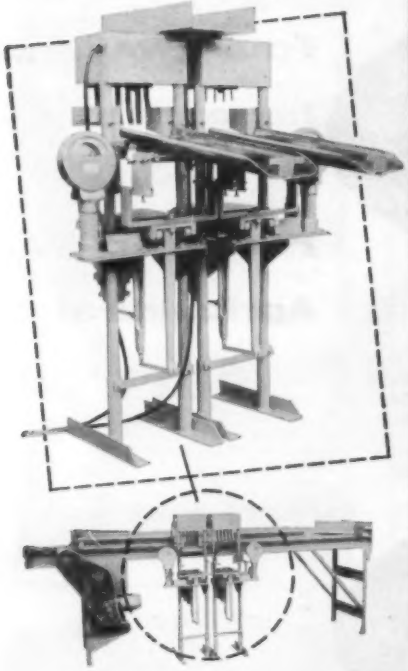

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BARK GRAFTING

Here are two easier ways to bark-graft your trees

By CARL J. HANSEN
University of California

BARK, cleft, saw-kerf, and several other less common methods may all be used to graft fruit trees, but each has its advantages and disadvantages. Bark grafting, however, gives the best results with walnuts and pecans, and together with saw-kerf grafting usually gives better results with peaches than cleft grafting.

In all methods of grafting it is necessary to line up the cambium of the stock and the cambium of the scion. The cambium, or growing layer, is found between the wood and bark of the branches being grafted. One reason that bark grafting is so easy to do is because the cambiums are automatically lined up when the scion is inserted between the bark and the wood of the stock.

The disadvantage of bark grafting is that it may be done only in early spring after the bark has begun to slip. By this time the buds are usually opening on the one-year wood that is to be used for scions. Usually, therefore, the scion wood must be gathered while still dormant and stored in a cool place in moist sphagnum moss, peat moss, or sand.

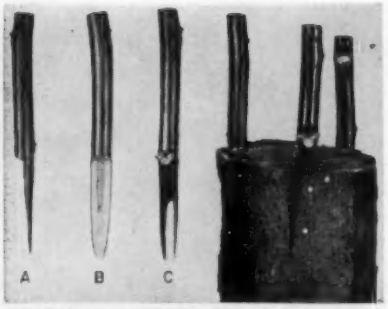
Modified Methods

In the old method of bark grafting, the bark was raised on both sides of a slit made in the bark of the stock. In Method No. 1 illustrated here, the bark is raised on only one side of a single slit. A scion is inserted under the raised bark so that one edge will rest against the undisturbed edge of the slit. It is usually necessary to cut a shoulder on the scion to reduce the thickness so that the bark of the stock will not be pushed out too far when the scion is inserted.

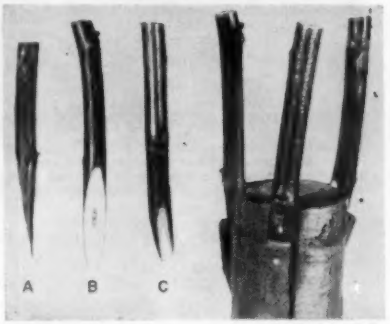
In Method No. 2, two slits, the width of the scion apart, are made in the bark of the stock. The scions for this method are much easier to cut than those used for Method No. 1, since they can be made without a shoulder.

Tack Scions in Place

Bark graft scions are best held in place with nails. The proper size of the nails depends on the size of the scion wood but for most deciduous fruits (except walnut) No. 20 flat-headed wire nails 5/8 or 3/4 inch long are satisfactory. Large walnut scions usually require No. 19 flat-headed wire nails 1 inch long.



METHOD NO. 1—Bark of stock is raised on one side of a single slit. Views of scion show: A) side view; B) side of scion that rests against wood of stock; C) opposite side from B.



METHOD NO. 2—Two slits are made in bark of stock, forming a channel. Views of scion show: A) side view; B) side of scion that rests against wood of stock; C) opposite side from B.

In Method No. 1 three or four nails are required. Two of these nails pass through the flap of bark and the scion. The other one or two nails are driven through the bark of the stock near the scion to pull the bark tightly in place.

In Method No. 2 the strip of bark between the two slits is raised and the upper one-third to one-half is usually removed. In this case two nails are used to hold the scion in place. The upper nail is driven directly into the scion but the lower one first passes through the strip of bark.

Protect Cut Surfaces

As soon as possible after the grafting is completed, wax over all cut surfaces, including the tops of the scions, to prevent drying out. Some grafting waxes are melted over a fire and applied with a brush, but water emulsions of asphalt which are applied cold may also be used. Remember, though, that the asphalt emulsions may be washed off if rain occurs before they have thoroughly dried.

If you are located in an area where warm weather is likely to occur during the grafting season, be sure to whitewash the stock and scions to help prevent sunburn. In one bark grafting experiment with walnuts, all the scions grew on the trees that were whitewashed but only 67% grew on the trees not whitewashed. THE END.

FLORIDA CITRUS

(*Continued from page* 15)

soil is alkaline, manganese is generally sprayed on the foliage.

Iron is sometimes actually deficient in the soil, but more commonly it is unavailable because of the high pH level or antagonism with copper accumulated in the soil through overuse.

Despite the many elements involved, the basic fertilizer program is relatively simple. The backbone of the program is three equal applications of mixed fertilizer containing nitrogen, potassium, and magnesium made each year in October, February, and May.

A commonly recommended mixture for old groves is 8-0-7 with 4% water-soluble magnesium oxide. Small amounts of manganese and boron are frequently added. Rates used provide 200 to 250 pounds of nitrogen per acre per year.

Young groves receive phosphorus, copper, and manganese regularly, but soil reserves of these elements can be accumulated and application of these elements is often omitted in groves over 10 years old.

In addition to the basic program, a few special measures must be taken. Iron in chelated form is applied to the soil when leaf symptoms of iron deficiency appear. Foliage sprays of zinc are used as a preventive measure and are most commonly applied in January. Molydenum foliage sprays are also used when symptoms of deficiency (yellow spot) appear. Boron may be used either as a foliage spray or included in the mixed fertilizer mentioned above.

A system of pH control is strongly recommended. The soil is sampled once annually for pH determination, and sufficient dolomite or limestone is added to hold the pH above 5.5 throughout the next year.

Such a program is not beyond improvement, and constant effort is being made to devise more effective and economical methods of supplying the fertilizer elements necessary for production of satisfactory crops. The success attained to date, however, has been an adequate basis for the establishment on Florida's sands of the largest citrus industry in the world. THE END.

FROM FRUIT JUICE TO FORDS

Citric acid, a natural component of lemon and other fruit juices, is the key to a new method of producing synthetic plastics such as used in the automotive industry, in the making of plastic boat hulls, and for other structural materials. Chas. Pfizer and Co., Inc., in a report to the American Chemical Society convention, said that citric acid looms as potential in this field because it is high in purity and moderate in cost, and can now be successfully combined with certain other elements.

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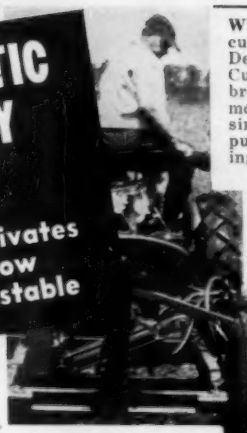

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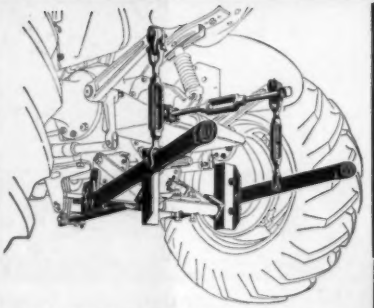

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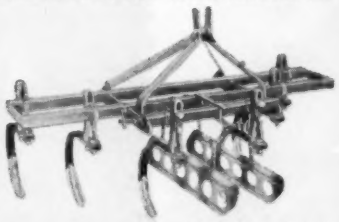

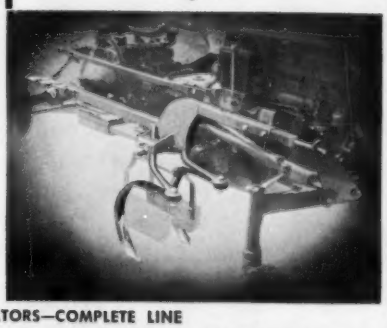

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Officers elected to serve Maine State Pomological Society for 1957 include, left to right: John McKeen, West Paris, executive committee; Arch D. Leavitt, Turner, treasurer; Donald G. Prince, Turner, president; Otto R. Wallingford, Auburn, second vice-president; Robert Waterman, Sanford, executive committee; Frank J. McDonald, Monmouth, secretary; Rockwood N. Berry, Livermore, member N. Y., N. E. Apple Institute.

STATE NEWS

(*Continued from page* 18)

OREGON—Dr. R. K. Kirsch, of Oregon State College soils department, recently reported results of a two-year study with fertilizers and lime on strawberries that indicated yields can be increased by relatively low rates of nitrogen (30 to 60 pounds of actual nitrogen per acre) while higher rates may increase the danger of rot. Phosphorus and potassium should be applied to soils testing medium and low in these elements. Lime has tended to decrease yields.—*Harold and Lillie Larsen.*

California Comments

CALIFORNIA—The Earl Fruit Company active in shipping fruit from the Loomis area in Placer County since the 1890's is discontinuing its packing and shipping operations and will transfer most of its machinery to a new plant in Yuba City. They will continue however, to act as the sales representatives for the Loomis Fruit Growers Association.

The elimination of Meyer lemon trees in citrus zones because they carry quick decline disease, as ordered by the state department of agriculture, has not been put in effect due to the fact that the disease has been discovered in orange trees in the San Joaquin Valley. Since the disease is already present in oranges, eliminating Meyer lemons now could aid in no way, reports Gilbert L. Stout, of the plant pathology department.

There is no evidence of the spread of the disease in the northern areas except through budwood.—*Neale Leslie.*

Maine Pomological Meets

MAINE—In spite of below zero temperatures and snow, several thousand persons attended the 16th annual Agricultural Show held at Lewiston in January.

This three-day affair gave Maine agricultural groups, including the Maine State Pomological Society, an opportunity to hold their annual business meetings and to listen to experts in their individual fields.

Featured out-of-state speaker was Dr. Firman E. Bear, New Brunswick, N.J. Dr. Bear advised scientific soil testing as the first step toward obtaining greater fertility. He also stressed the need for liberal liming for most crops, the importance of drainage, the value of fertilizing a cover crop, and the need for quality seed.

William Dean Haskins, Cape Elizabeth, was named outstanding member of the society for 1956.

PRUNING DAY

Kentucky's annual peach pruning field meeting will be held on Friday, March 15, at Kentucky Cardinal Orchards, Henderson. Frank Street is manager of the orchards. This meeting has been attended the past several years by growers from six or more states. If you plan to attend, bring raincoats, boots, and "heavies" for you are sure to need them.—*W. W. Magill.*

Berry Shows Promise

OHIO—R. G. Hill, Jr., horticulturist at the Wooster Experiment Station, suggests that growers interested in an early strawberry make trial plantings of Earlidawn. This early variety which will be available to growers this spring from commercial sources, was developed by the USDA at Beltsville, Md., and has been under test at Wooster for three seasons.

Optimistic Growers

MARYLAND—An attitude of optimism sparked the annual winter meeting of the Maryland State Horticultural Society held in Hagerstown.

Thoughts that came from the meeting were the need to improve grading and packing and the necessity of a co-operative sales plan that could offer larger quantities of fruit packed to the standard demanded by the buyers.

Joe E. James, peach orchardist and associate of the California Spray-Chemical Corporation, died suddenly on January 24. A Joe E. James Memorial Scholarship Fund in horticulture at the University of Maryland has been established in his memory. Contributions may be sent to the California Spray-Chemical Corporation, 133 Kings Highway East, Haddonfield, N.J.

Olin R. Higgins passed away on January 25 after a heart attack. Mr. Higgins, a past president of the Peninsula Horticultural Society, recently retired from extensive peach growing.—*A. F. Vierheller, Sec'y, College Park.*

CALENDAR OF COMING MEETINGS & EXHIBITS

Mar 4—Southeastern Pecan Growers Association 50th convention, Buena Vista Hotel, Biloxi, Miss.—H. S. Jennings, Sec'y, Dawson, Ga.

Mar. 15—Annual Kentucky Peach Pruning Field meeting, Kentucky Cardinal Orchards, Frank Street, Manager, Henderson.—W. W. Magill, Ext. Hort., Lexington.

April 1-4—Maine Farm and Home Week 50th anniversary, University of Maine, Orono.—Roderick L. Reynolds, Extension Service, U. of Maine, Orono.

May 2-3—Shenandoah Apple Blossom Festival, Winchester, Virginia.

June 12—Illinois Summer Orchard Day, at Eckert Orchard Association, Belleville.—Harold J. Hartley, Sec'y, Carbondale.

June 13—Small Fruits Day, Ohio Agricultural Experiment Station, Wooster.

June 17-20—National Apple Institute annual meeting, St. Joseph, Mich.—Truman Nold, Exec. Sec'y, 726 Jackson Pl., Washington 6, D. C.

Aug. 5-7—International Apple Association annual convention, Netherland-Hilton Hotel, Cincinnati.—Fred W. Burrows, Exec. Vice-Pres., 1302 18th St., N.W., Washington, D. C.

Aug. 13-14—Ohio Pesticide Institute, Ohio Agricultural Experiment Station, Wooster.

Aug. 15—Ohio Orchard Day, Ohio Agricultural Experiment Station, Wooster.

Sept. 15-18—Produce Packaging Association 7th annual conference and exposition, Shoreham Hotel, Washington, D. C.

Oct. 9-11—Florida Fruit & Vegetable Association 14th annual convention, Hotel Fontainebleau, Miami Beach.—Florida Fruit & Vegetable Assoc., 4401 E. Colonial Drive, Orlando.

Nov. 14-15—Western Growers Association 32nd annual convention, Hotel del Coronado, Coronado, Calif. Headquarters: 606 So. Hill St., Los Angeles 14, Calif.

Nov. 25-26—Illinois State Horticultural Society and Illinois Fruit Council annual meeting, Abraham Lincoln Hotel, Springfield.—Harold J. Hartley, Sec'y, Carbondale.

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CORRECTING NUTRIENT DEFICIENCIES

(*Continued from page* 15)

deficiencies have been noted and corrected. In these soils the major elements, such as nitrogen, potassium, and magnesium, also are likely to be limited.

As for phosphorus, there are very limited data indicating a response by fruit plants other than strawberries to phosphorus applications. Nevertheless, in humid areas it is a common practice to use an N-P-K base mix. For fruit plantings in general, a 1-1-1 ratio seems to be the most widely used; however, where the soil is quite sandy, a 1-2 ratio of N to K is frequently used and may be needed, although we do not have sufficient experimental data to back this suggestion. It is based on results with citrus in Florida in sandy soils; also, a 5-10-10 has been used for many years on sandy soils in the mid-Atlantic states.

If the soil is in a humid region and is reasonably fertile, and the orchard is young, nitrogen might be the only nutrient needed. If the orchard is about 25 years or older, however, the use of potash and possibly boron should be considered.

On sandy soils in *humid* regions an N-P-K base mix would seem advisable. If organic matter is low, other nutrients may give response if included on an insurance basis. If this is desired, a magnesium oxide content in a complete mix should be about the same as the nitrogen percentage; for example, if a 5-10-10 is used, about 4 to 5% magnesium oxide should be included.

Borax can be included so that not more than about 5 pounds per acre per year is applied. In a 5-10-10 mix this would be about 10 pounds of borax per ton. Peaches are very sensitive to excessive use of borax, whereas apples will tolerate up to a pound or more per mature tree, provided it is not applied more often than every third year.

In the above base mix and on a ton basis, the following nutrients may also be included: 20 pounds each of manganese and zinc sulfate, 10 pounds of copper sulfate, 30 pounds of iron sulfate, and 1 pound of sodium or ammonium molybdate. There are proprietory minor element mixes on the market, such as FTE (Ferro Corporation, Cleveland, Ohio) and Esminel (Tennessee Corporation, Atlanta, Ga.), which can be mixed conveniently with N-P-K-magnesium base mixes at 50 to 100 pounds per ton.

Old orchards in moderately fertile soil which have lost vigor frequently can be brought back to good production by good pruning practice and by doubling or quadrupling the nitrogen applications until vigor is restored. Borax at ½ to 1 pound per mature apple tree may help. If the area is humid and potash has not been applied regularly, this element may be needed and can be applied in an N-P-K-standard mix, such as 8-8-8 or 10-10-10. A moderate application of 10-10-10 would be 10 pounds per mature tree (1 pound of actual nitrogen). Additional nitrogen can be applied as ammonium nitrate up to possibly 10 pounds per tree if vigor is low.

Another practice which has succeeded in restoring vigor to old trees when others have failed is the application of a heavy, high-nitrogen mulch. C. P. Harley, of the USDA, Beltsville, Md., obtained good results on old York trees ready to be pulled by applying a high-nitrogen orchard grass mulch that had been grown on bottom land with 400 pounds per acre of ammonium nitrate. A 1-2 mulch mixture of grain straw and legume hay, such as alfalfa, also should be satisfactory. Results may be seen the same season of application, but usually it takes a year or so.

In humid regions it is advisable to maintain the pH around 6.0 by the use of dolomite (high-magnesium limestone), if the soil test shows medium to low magnesium.

Soil or Leaf Analysis?

In regard to soil tests it should be stated that insofar as fruit crops are concerned, about the only value of soil analysis is to indicate the pH and whether the potash, magnesium, and phosphorus (and boron where analyzed) are excessively high or low.

The main difficulty is getting a representative sample of soil in an orchard for a reasonably accurate soil test. With perennial trees which are deeply rooted, even as deep as 30 feet in loess soil, the roots will be feeding at much lower depths than that from which the soil sample is taken. It is true that 80 to 90% of the roots are in the upper foot of soil, but where a deficiency occurs, the lower feeding roots apparently pick up needed nutrients from lower depths.

It appears that our best indication of nutritional needs by trees and other deep-rooted plants is, in addition to soil tests, a chemical analysis of the leaves. This latter service is being carried out by some states for interested growers, usually at an added cost. THE END.

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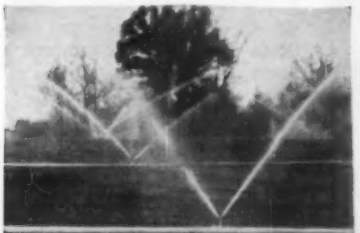

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Some Notes on FERTILIZER Schedules

Sample fertilizer programs for apples, peaches, cherries, plums and grapes show trend toward "balanced nutrition"

Following are listed some sample fertilizer schedules for different fruits from different areas. These programs are not recommended specifically for your orchard or vineyard if you are not in the area mentioned but it is hoped that knowledge of how fertilizer practice varies will give some insight into your own fertilizer program and perhaps influence some critical thinking on how it can be improved. Fertilizer programs should meet the problems of the individual orchard depending on soil type, soil analysis, leaf analysis, kind and variety of fruit, age of trees, and market requirements.

WASHINGTON STATE APPLES

The commercial apple grower in central Washington is concerned with three nutrient elements in his fertilizer program—nitrogen, boron, and zinc. The first two, nitrogen and boron, are natively in short supply in the commercial orchard soils of Central Washington. These two fertilizer elements must be applied regularly. Zinc is present in these orchard soils in ample amounts, but for some undetermined reason it is not always available to the trees. Zinc must be applied to the trees in the form of spray at any time the zinc deficiency symptoms of "rosette" appear.

A sample fertilizer program applied to a bearing apple orchard for the 1957 season would be:

1) Two pounds of actual nitrogen (6 pounds ammonium nitrate) is applied to each tree in late fall, late November or early December. This is broadcast by hand under the drip of the branches all the way around each tree.

2) In late March a dormant spray of 15 pounds of actual zinc (45 pounds of 32% zinc sulfate) per acre will be applied. This may be applied by ground or airplane spray.

3) Polybor or Boro-spray at the rate of 5 pounds per acre will be applied with the first cover spray for insects in mid-May.

There may be variations of this sample fertilizer program. Half of the nitrogen fertilizer could be applied in early spring to the soil and the remainder applied in the form of urea sprays in May or early June. Many growers are planning to use this latter method because the foliage application of nitrogen may give better response on the older bearing trees that have suffered light winter damage.

Dormant zinc applications will be more generally applied in 1957 because there is an increased tendency for bearing apples to suffer from zinc deficiency following slight to moderate winter injury as occurred in the late fall and winter of 1955-56.—*Dick Bartram, Chelan County Agent.*

NEW JERSEY PEACHES

The following program has been used by a number of growers in Southern New Jersey on light sandy loam soils, low in organic matter. It was prepared by Dr. Benjamin Wolf, a local specialist who conducts his own business assisting growers.

Soil is adjusted to pH between 6.0 and 6.5 by the use of dolomitic limestone if soil test shows medium to low magnesium, otherwise high calcium limestone is used. 5-10-10 fertilizer

OHIO GRAPES

STANDARD[1] FERTILIZER SCHEDULE FOR OHIO VINEYARDS

Fertilizer Material	Source of	Rate in lbs./Acre	Time	Application Method
Ammonium nitrate	Nitrogen	180-240	Apr. 1-15	In a band 2 ft. wide beneath trellis
OR				
Sulfate of ammonia	Nitrogen	300-400	Apr. 1	Same as above
OR				
Nitrate of soda	Nitrogen	375-500	Apr. 15	Same as above
PLUS				
3-12-12[2]	Nitrogen, phosphorus, & potassium	300	Sept. 1-15	Drilled with cover crop

[1]For potassium deficient vineyards apply 600 to 800 lbs. per acre of potassium sulfate in addition to nitrogen shown above. Application may be made from February through September, preferably as soon as possible after potassium deficiency is detected.

[2]Applied only when cover crop is shown.

—*J. M. Beattie, Ohio Agr. Exp. Sta.*

is used with the following amounts of minor elements added per ton: Manganese sulfate, 20 pounds; borax, 10 pounds; copper sulfate, 10 pounds; zinc sulfate, 20 pounds; and 2 units of magnesium oxide. The fertilizer is drilled before growth starts at 1000 pounds per acre.

In old orchards which have become low in vigor, the following additional sprays are used: A zinc sulfate dormant spray is applied just before buds break, using 10 pounds per 100 gallons of a 36% zinc sulfate. Two or three nutritional foliar sprays are applied separately from regular pest sprays, when good foliage has developed and at about 10-day intervals. This usually is in June or early July for south Jersey. Spray composition in 100 gallons is: manganese sulfate, 8 ounces; zinc sulfate, 1 ounce; copper sulfate, 1 ounce; ammonium molybdate, 1 ounce; iron chelate, 4 ounces; and magnesium sulfate, 4 pounds. The spray may also contain monopotassium phosphate, 2 pounds and urea, 3 to 5 pounds.

MICHIGAN SOUR CHERRIES

In general, we believe that fruit trees grow very well when the phosphorus content of the soil is 40 to 50 pounds per acre and the potassium analysis is 150 to 200 pounds per acre based upon the Michigan reserve soil test standards. This assumption is made with the consideration that nitrogen is adequate. To meet these standards, the following is the most common commercial fertilizer program found in northwestern Michigan:

Fertilizer with cover crops is applied August 15 to September 15. A 1-4-4 type analysis is used, either a 4-16-16 or 5-20-20 fertilizer at 250 to 400 pounds per acre.

The alternate practice on cherry orchards in sod is to apply, between October 15 and December 1, a 1-1-1 type fertilizer or a 2-1-2 type at 600 to 800 pounds per acre (usually 12-12-12 or 12-6-12).

Generally, the additional nitrogen required to produce satisfactory growth of trees is applied as ammonium nitrate or similar types of fertilizer in the spring at least two weeks before growth starts. The average mature orchard would require 3 to 5 pounds of ammonium nitrate per tree in the spring in addition to the nitrates applied during the late fall season.

Leaf analysis in northwestern Michigan reveals that there is a possibility that many deficiencies are occurring in the trace elements. Boron, manganese, magnesium, and iron seem to be deficient most commonly. We do not, however, have good commercial fertilizers in soil application which will meet the requirements of these deficiencies.

Growers are experimenting with the application of liquid trace element fertilizer applied directly on the dormant trees and on foliage. Much of the pioneering work is purely unscientific. There is a growing belief that more satisfactory results are obtained in many cases.—*Clarence Mullett, District Horticultural Agent.*

VERMONT APPLES

SUGGESTED FERTILIZER PROGRAM FOR BEARING VERMONT APPLES IN SOD MULCH
(Repeat every three years)

First Year

Material		Remarks
Magnesium limestone	1-1½ tons/A	Broadcast where magnesium deficiency has been observed.
Epsom salts	15 lbs./100 gal. spray	
Borax	4-16 oz./tree	12 to 18 inch ring just inside drip line.
Nitrogen:		
Ammonium nitrate	1 lb./tree	Ring application
or Urea	1 lb./tree	Three to four sprays at 5 lbs./100 gal. Begin with pre-pink.
or Mulch	400-500 lbs./tree	

Second Year

Complete fertilizer (N-P-K)		
10-10-10	800-1000 lbs./A	Less if in ring.
or 5-10-10	800-1000 lbs./A	Plus ammonium nitrate of two urea sprays.
or 0-20-20	600-800 lbs./A	And amonium nitrate or four to five urea sprays.

Third Year

Nitrogen:	
Ammonium nitrate	Same amounts as first year
Urea	
Mulch	

—*C. H. Blasberg, University of Vermont.*

CALIFORNIA SHIPPING PLUMS

A typical example of fertilizer practice in California shipping plums is provided by an orchard of Santa Rosa (a Japanese variety) in Kern County, in the southern San Joaquin Valley.

This orchard is on Hanford sand, a light, well-drained soil without much change in texture in the upper 10 feet. The soil is fertile for so light a texture. It is irrigated. Yields run about 400 pounds per tree. Harvest usually falls in mid-June.

Clean cultivation is followed in the summer with a winter cover crop. A program of nitrogen alone is used. Ammonium nitrate is usually applied in January at the rate of 300 pounds per acre (100 pounds of actual N). Higher rates have caused some delay in maturity. A single application has proven satisfactory.—*E. L. Proebsting, University of California.*

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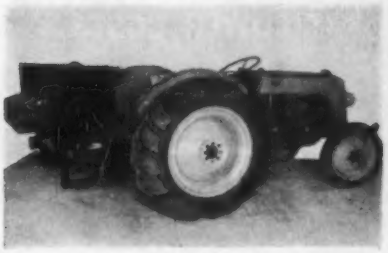

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Caring for 165 acres of fruit—125 acres in apples, 20 in peaches and 20 in cherries—is a lot of work. About two weeks ago I talked to Grower John Bream in Orrtanna, Pa., to find out how he does it. Mr. Bream believes the secret to his success is his new Duo-Fan sprayer. The machine gives him more air volume and operates at only 1800 r.p.m. Because the new sprayer covers two rows at once, costs are reduced. Mr. Bream says, "There is nothing I don't like about the new sprayer; it is easily serviced, and after a season's use there appear to be no major parts which can wear out."

The machine uses 11 gallons of gasoline an hour, which is much cheaper than his old rig which used 8 to 9 gallons an

hour, but sprayed only one row. By using a 3X concentration, and considering gasoline and labor economy, the Breams saved 25% on their sprayer costs in 1956. The new sprayer is equipped with an International Harvester heavy-duty engine, and Mr. Bream will be glad to show his new sprayer to any of our readers who happen to be in his area. Known as the Hardie DF-40 Duo-Fan, this sprayer is making spraying records wherever it is used. Grower Bream is fortunate to have Dan Wolff, of Wolff Supply Co., Biglerville, Pa., close at hand. Mr. Wolff sold the sprayer to Mr. Bream, and the continuing service checks by the dealer keep the equipment in top shape. Mr. Wolff, the International dealer in Biglerville, is highly respected by all growers in the area for excellent service at any time.

Grower Bream has streamlined his fruit growing operation from picking to spraying. Pneumatic pruners, 2-speed axle trucks and International tractors keep costs down and profits high. It will pay you to get all of the facts on the new Duo-Fan Hardie Sprayer. You can do it by writing Bob Potteiger, Hardie Manufacturing Co., Hudson, Mich. If you happen to be near Orrtanna, Pa. or Biglerville, stop in and see Grower Bream or Mr. Wolff.

SPREADING FERTILIZER

There are many ideas on how and where to place fertilizers

A SURPRISINGLY large amount of fertilizer is still applied by hand despite recent advances in farm machinery. In New Jersey, for instance, N. F. Childers, of Rutgers University, reports that with tree fruits much of the fertilizer is applied by hand in a 2- to 4-foot band in a ring underneath the outside drip of the branches, the width of the band depending upon the size of the tree. For small trees it may be only 6 to 12 inches wide.

For peach trees where they are planted more closely in the row than between the rows, the lime spreader frequently is used.

In old orchards or mature orchards where the trees cover most of the orchard floor, some growers use the G.L.F. service to apply the fertilizer over the orchard floor from a 6-ton endgate spreader. A few growers are using a Florida citrus grove-type spreader to give an over-all spread on the orchard floor. These machines will apply 200 pounds up per acre.

Where to Place Fertilizer

To do the most good, a fertilizer spreader should apply the fertilizer in a 2- to 4-foot band under the outside drip of the branches.

In general, it is true that roots beneath certain sections of the tree feed those sections of the tree, and if the ground is not fertilized in these areas, then certain portions of the tree are likely to suffer.

If the fertilizer is spread out over the orchard floor, it is necessary to apply considerably more fertilizer per acre in order for the tree to get what it needs from beneath its branches. Fertilizer applied between the rows may have little or no effect on growth of the trees, except possibly indirectly by its effect on the cover crop.

A method of applying solid fertilizer well-liked by some growers is the tractor mounted whirlwind applicator which is driven around the tree to place the fertilizer under the drip of the branches.

At the recent meeting of the New York State Horticultural Society, grower Cameron Garman told of his experience with the Skibbee fertilizer sower which operates on the whirlwind or rotating principle and which costs in the neighborhood of $225. He concluded by saying he believed it saved him more labor than any other tool on the farm. THE END.

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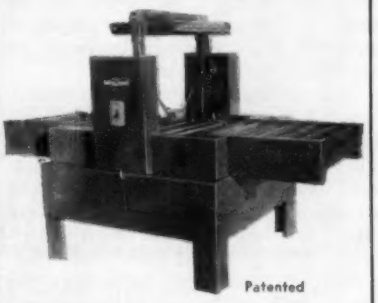

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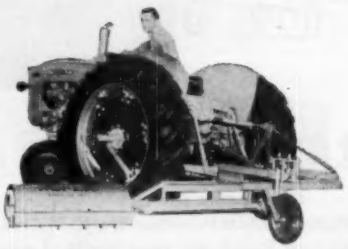

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PRUNE DISEASES

Idaho growers face three major problems: Cytospora canker, fruit necroses and gummoses, and leaf spotting conditions

THE arid nature of most of Idaho's prune land has left orchards relatively free of diseases of known parasitic cause. There is, however, one major exception. It is the *Cytospora* canker problem.

The *Cytospora* fungus on fruit trees has been commonplace for a long time, but before 1951 it showed up as a saprophyte or, at best, a weak parasite. In 1951, however, one or more strains of *Cytospora* began to invade healthy trees in Idaho in an aggressive, parasitic manner.

The sudden below-zero temperatures of November, 1955, caught most Idaho prune orchards with new wood not yet mature. As a result, the damage sustained was widespread and serious. Trees that did not die were often so wounded that ideal entry points were provided for *Cytospora*.

By late summer following the freeze damage normal callusing and healing should have been developing, but this did not occur. Expanding necrotic cankers were prominent and additional branches were succumbing, not to direct freeze damage, but to active invasion by the *Cytospora* fungus.

The fungus seems to be most active during periods when pruning normally should be done, and wounds made by pruning tools may well be functioning as prime entry points. Perhaps leaf scars act as entry pathways.

Control Measures

Growers are advised to prune out all suspicious parts during the usual pruning season, but to do this wisely by cutting close and cutting clean. Cutting should be done far enough below the lowermost edge of the canker to be certain that all of the infection is pruned out. One foot below the recognizable canker edge is a good place to start. A clean-up pruning operation in the summer can get many of the small cankers missed earlier.

First-year Cytospora canker of President prune, showing edges of the canker and pycnidial pimples immediately behind the margin in the necrotic, or dead, area. Black specks are pycnidia, where fungus spores are produced and later extruded in hair-like tendrils.

Wounds should be painted immediately with a disinfectant paste. Any standard fungicidal wound preparation such as Bordeaux paste may be used, or a copper fungicide may be mixed with any standard wound-treating preparation.

Such measures do not constitute cures, however. *Cytospora* can come in from considerable distances—perhaps even from wild hosts.

It will help if the grower maintains a good disease and pest control program for the common disorders he is accustomed to, because a fungicide covering on the trees at all times possible will constitute additional insurance when the spores come in. It will also help if he keeps his orchards in optimum condition by following all recommended cultural practices.

A. W. Helton has been doing research work on Cytospora since 1951 and is the author of Bulletin 254, "Cytospora Canker of Prunes," which discusses the problem in extensive detail. It is available from the Extension Service, University of Idaho, Moscow.

Internal Necroses, Gummoses

Another problem confronting Italian prune growers is that the fruits suffer damage from internal necroses and gummoses. One or more of these may develop at any time from the green fruit stage to and during storage. The cause is not definitely known; there are numerous theories ranging from moisture stresses through temperature deviations during the maturing process to imbalance of hormones.

Rootstocks probably play a part in this deterioration, but the consistency

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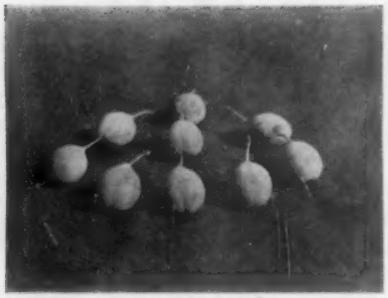


External gummosis of Italian prunes: gum was extruded from necrotic spots in fruit flesh.

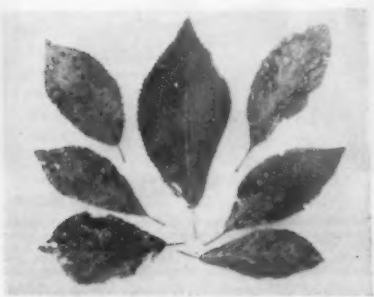
of tree misbehavior, whether on Lovell peach or Myrobalan plum stocks, for example, leads me to believe that the difficulty is primarily in the Italian scion wood.

The seriousness of the condition varies considerably from season to season, so it is probably true that the directly precipitating factors are traceable to something in the environment.

Dr. Earle Blodgett, of the Irrigation Experiment Station at Prosser, Wash., is working with a selected clone of Italian which is substantially superior to any of the clones now being propagated. He refers to it as the PRH-1 selection. Most of us in the West recommend that our nurseries propagate only this strain of Italian, although even it breaks down to some extent under certain conditions and develops mild forms of the typical Italian abnormalities.

Leaf Spotting

Numerous leaf spotting conditions have also been common for a long time in our prune orchards. We would like nothing better than to correct these with a spray schedule, but as in the case of the internal fruit necroses and gummoses, we don't know anything that will do the job. Grafting studies conducted in Washington and verified in Idaho show that some of the necrotic leaf spotting conditions are nontransmissible, that they are bud-perpetuated, and therefore genetic abnormalities. THE END.



Random brown leaf spot on leaves of Italian prune. This is a moderately severe form; some are milder and some are much worse than this.

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Citrus Trees Were Dying

In Florida, for example, before chelates were discovered, hundreds of acres of citrus were out of production and dying from lack of iron. More than half the citrus trees were deficient in iron. Where chlorosis was severe, branches were dying back, leaves were yellow, and production and quality of fruit was well below normal. Growers had no recourse but to start over again on soil that was not deficient in this important element.

Today the picture is much brighter, reports Dr. Ivan Stewart, of the Citrus Experiment Station at Lake Alfred. About a half million pounds of chelated iron (Fe EDTA) are being applied annually, mostly on citrus trees. Response is very rapid —chlorotic trees are usually green six weeks after treatment.

The chelate is generally mixed with other fertilizers and applied to the soil with conventional spreaders. When there is ripe fruit on the trees, pelletized chelates or the Dow vermiculite form chelates are usually used because of the danger of burn from dust settling on the fruit. A treatment generally lasts from one to two years.

Florida's soils are mostly acid, and Fe EDTA has worked very well in this soil type. On the calcareous soils along the East Coast it is not effective. Another chelate, Fe Versnol, is being used in limited quantities. Some experimental chelates have proved very effective, Stewart reports, but they are not yet commercially available.

In the West, where soils are generally highly alkaline, growers encountered the same difficulty with Fe EDTA. California growers are getting good results from the iron chelate, Fe 138. Applied to trees covered with necrotic spots, their foliage yellow and thin, Fe 138 turned them deep green in full flush of growth after a few weeks.

In Utah, experiment station workers have been testing iron chelates

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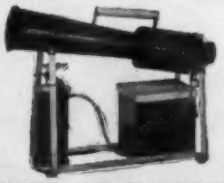

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for two years. Working with the chelates developed especially for western alkaline soils, they found that small amounts of chelated iron would cure lime-induced chlorosis of many fruit trees, notably peach.

Mature, bearing peach trees that showed advance stages of chlorosis were treated with DTPA-Fe in the spring of 1954. As little as 400 grams per tree (less than a pound) greened up the severely chlorotic trees.

Iron Chelates on Pears

Pear growers in the Rogue River Valley of Oregon are using iron chelates in yet another way. The clay adobe soils of that area proved too heavy for chelates applied on the soil surface. However, growers found that soil injections of chelates into the root zone at the rate of 1 pound per tree was highly effective. About 70 pounds of material per acre is required for each acre of pear trees.

Foliar sprays of iron chelates have also worked well in the Rogue River Valley. Chlorotic Anjou pear trees sprayed with chelated iron greened up sufficiently to permit normal growth and set so many buds the following year that hand-thinning was necessary. THE END.

LEAF ANALYSIS

(*Continued from page* 46)

certain methods. It is doubtful that the cost can become much less than $1.00 per nutrient element or $10.00 per sample. In Michigan, the charge is $5.00 per sample. The state experiment station is at the moment absorbing the remainder of the cost because the analyses are being used in a research project.

What new developments in leaf analysis can be expected in the future?

At present, most of the leaf samples are from sites where the trees are not doing well and leaf analysis is used to unravel the trouble. However, we expect more use of leaf analysis as an annual check on the fertilizer needs for each block of fruit. There are growers in Michigan using it this way now. We expect leaf analysis will be used more widely by the nurseryman for ornamental trees and shrubs.

A more recent and fascinating idea involves fruit as well as leaf analysis as a means of quality control and estimation of storage life. Here we have a new field that is still an infant.

Improvements in spectographic equipment are being made. The new direct reading spectograph will reduce greatly the time required to analyze a sample. THE END.

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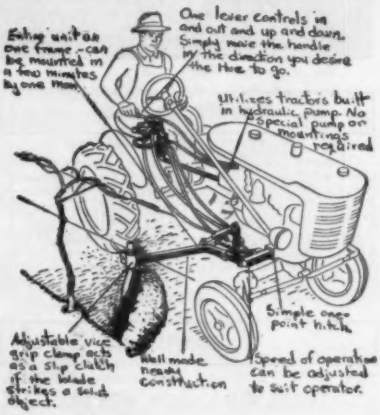
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2 to 3 feet,	25	for	$25.00;	100	for $80.00

MOUNTAIN LAUREL
Dainty Pink Flowering,

18 to 24 inches,	25	for	$15.00;	100	for $50.00
2 to 3 feet,	25	for	$25.00;	100	for $80.00

CANADIAN HEMLOCK
Beautiful Evergreen Foliage,

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American Fruit Grower

• Fruit for Health •

RICHARD T. MEISTER, *Editor*
H. B. TUKEY, *Associate Editor*

Let's Stop the Public from Biting the Hand that Feeds Them!

TELL the average city man that the gross returns to farmers for foodstuffs amounted to only $18.2 billion in 1955 and he will never believe you! This is for *all* foodstuffs, as reported by the USDA.

In the same year, the gross product of the United States from all sources was valued at nearly $400 billion, and reached $414 billion in 1956. But the amount of this vast sum which the farmer received for foodstuffs was less than 5 per cent.

Or, if you think in terms of the proposed national budget of near $72 billion, the farmer feeds the country for only one-quarter of that amount. Or again, the figure for food is only 4½ times what we give to foreign countries each year! Or, still again, it costs $27 billion to market this $18.2 billion of foodstuffs which the farmer produces!

Those who talk about the farmer and his "gouging ways" and his "unreasonable attitude towards prices and support" should stop and think for a minute.

The farmer is supplying all the American-produced foodstuffs which the people in this country eat, for so small a sum that most people will not believe it.

Somehow the average city man has gotten the idea that farmers are rich, that they are leaches on society. Can't somebody tell the facts? Where are our public relations experts? Who is helping in this educational program anyway?

TOWARD MORE EXACT FERTILIZATION

INFORMATION is now accumulating from research projects that will soon place orchard fertilization on a truly scientific basis. We look forward in the near future to improvements and refinements in materials, methods of application, and most of all, in ways of determining precisely the tree's needs.

We are just now becoming familiar with leaf analysis. Deficiencies of nitrogen, potassium, phosphorus, magnesium, manganese, or boron can be discovered and identified through analysis of the leaves. But just identifying the troublemaker is not the end. In fact it is hardly a beginning.

To make leaf analysis of practical orchard use, a set of standards must be established. The optimum leaf content of each element for best tree growth and production must be determined. Then too, there may be varietal differences in such levels, or the optimum level may vary from one area to another. These refinements in methods of leaf analysis are being established now.

Leaf analysis is not the only tool, however, in good fertilization. The grower must combine several guides to get at his specific fertilizer problems. Soil analysis will play a greater role when combined with leaf analysis results.

Another useful tool is your own experience, or "sixth sense." Your observations will tell you where poor color of fruit is chronic, foliage is sparse or "sickly" in appearance, a good set of fruit rarely occurs, or now growth is short or thin. In other words, you know how your orchard should look. The soil and leaf analyses may then pinpoint the trouble spot.

Fruit Talk

One of the **features of America** is the ability of individuals to **co-operate and work together.** We accept this as normal practice. Only when one gets around the world and sees how other people operate does he realize that this is perhaps the most important **key to American success.**

Fertilizers and irrigation can **individually** increase yields, but **both** together can more than double what each can do alone.

The *New Jersey Horticultural News* reports that in 20 years a peach orchard will remove from the soil the equivalent of 1000 pounds of 20% **superphosphate,** 2200 pounds of 60% muriate of **potash,** 5450 pounds of **nitrate of soda,** 260 pounds of **dolomitic limestone,** and small amounts of zinc, copper, iron, boron, and manganese. This is why the **soil must be replenished.**

Colorado A & M College reaffirms that **sawdust** is a good mulch—conserves moisture, suppresses weeds, and improves heavy soil when plowed under. Nitrogen deficiency can be corrected by adding nitrogen to equal 1.5% (7 or 8 parts of ammonium sulfate to each 100 pounds of sawdust or 2½ pounds per bushel).

—H. B. T.

L. J. Edgerton of Cornell feels that too early fall applications of nitrogenous fertilizers may tend to greater **susceptibility** of trees to injury from winter cold snaps—especially **early cold snaps;** but that late October applications of **urea as a spray** have less effect and that **ground applications in December** may be satisfactory.

C. C. Doll of **Iowa State College** reports grape roots extending 22 feet horizontally and 15 feet vertically in a fertile silt-loam soil.

One of the best observers and students of trees in the United States is **E. S. Hubbard, of Poughkeepsie, N.Y.,** who points out: "When we see an orchard we see but a part of it. The most important part is out of sight. Until we know how the root system grows, what it needs in food, what physical condition is best, we are **groping in the dark."**

Never forget that **marketing** does not begin merely at the **farm gate,** as so many who should know better try to insist. Marketing begins back **in the field** with the choice of the variety, the site, and the planting, and it continues straight through to the **palate of the satisfied consumer.**

Carroll R. Miller of West Virginia has written interestingly on "Who Sets the Price of Apples," and concludes among other valuable observations that " . . . . . **the growers** themselves largely set price levels for their fruit; either destructively, by bad marketing practices; or constructively, by team work in meeting today's conditions."

—H.B.T.

Coming Next Month

Weather Issue

- Orchard Heating
- Lessons from the Great Freezes in History
- The Pros and Cons of Cloud Seeding
- Is Our Climate Changing?
- Thirty Years Without a Killing Frost!
- How to Predict Minimum Temperatures in Your Orchard
- Special Report on Pollination

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Fertilizer Compound

low biuret

(Less than 0.2%)

and completely water soluble!

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2. Makes Possible Maximum Yields *and* Top Quality.

3. Saves Time, Labor, Equipment.

The low biuret content of new Grace Crystal Urea gives you concentrated nitrogen (46%) that's *completely safe* for foliar application.

The nitrogen in Grace Crystal Urea is *immediately* available to plants, and the nitrogen goes to work almost at once. Supplying this *extra* nitrogen in this easy way gives you maximum yields *and* top quality.

Response in terms of improved foliage, color or growth may be seen within a few days after spraying. Even when soil conditions are poor—for example, when there is excessive dryness, wetness, cold, or leaching from heavy rains—response from foliar feeding with Grace Crystal Urea is good—and fast.

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FOR SOIL APPLICATION use free-flowing Grace Urea Prills. Guaranteed **46%** Nitrogen. Ideal for Top-Dressing or Side-Dressing of fruits and vegetables, as well as field crops.

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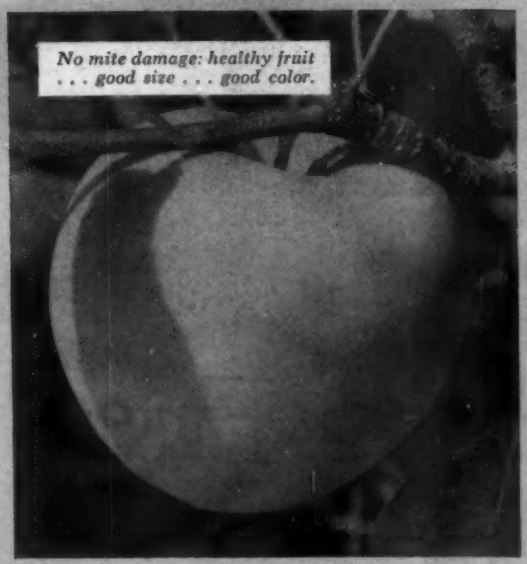

No mite damage: healthy fruit . . . good size . . . good color.

Mite damage: tell-tale bronzing of leaves...poor fruit size...poor color.

what might have been...if no mites had been!

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One application does the job! Gives outstanding control of European red mite and clover (almond) mite.

Longer lasting! Reduces number of midsummer sprays required. Results often extend into following year!

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